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Original Articles

RETARDATION AND CONSTITUTIONAL INFERIORITY IN CONNECTION WITH EDUCATION AND CRIME[1]

JOHN JENKS THOMAS, A.M., M.D.
BOSTON

It is with some misgivings that I have undertaken to open this discussion upon retardation and constitutional inferiority in connection with education and crime, because of the almost countless aspects which the subject has, and a profound sense of my own inability to treat of it at all adequately, but I trust that what I have to say may at least act as an inspiration to those who are present, who will be able to throw more light upon some of these aspects.

First of all, of course, arises the question as to what we should understand by retardation and constitutional inferiority. In regard to the first of these, retardation, I shall take it for granted that we may neglect the falling behind in the school routine which is caused by such things as absence due to acute diseases of various kinds and also that arising from the removal of children from one school to another, where the dropping back in grades can be accounted for by lack of correspondence in the subjects taught in the different schools. On a somewhat different footing stands retardation in the schools due to sense defect, such as imperfect sight, or hearing. Cases of this description have been made the subject of investigation recently in the public schools of Boston. The masters were requested to report such cases to the school board, and these children were then examined by physicians who were specialists in such troubles, and the results were rather unsatisfactory, in that it was found that in a very large proportion of cases in which the backwardness in school work was supposed to be due to a sense defect this was not the case, the parents and teachers having erred. Partly on this account, therefore, and partly because in many of the cases when sense defects are present they can be easily corrected, it has seemed to me best to omit this class of cases from consideration. Adenoid disease stands upon a somewhat similar footing. Undoubtedly the presence of marked enlargement of adenoid tissue in the naso-pharynx has a deleterious effect upon the vigor of a child, and is a frequent cause of impairment of hearing, but in my opinion the presence of adenoid disease, aside from its effects in causing absence from school, or by impairment of hearing, is never the cause of any serious retardation in school work.

---

[1] Read at the meeting of the American Neurological Association in Boston, May 31, 1912.

In the Report of the Health Department of the City of Boston, under which department the medical inspection of the public schools is placed, I find the following figures:

Pupils Examined	1908, 51,099	1909, 68,858	1910, 61,055
Adenoid disease	2,075	2,892	3,087
Imperfect hearing	194	313	327
Imperfect sight	883	608	617
Epilepsy	11	13	13

What proportion of these children in whom these defects were found on examination were retarded in their school work, I cannot give you exactly, but the proportion was not large.

If we take up the question of the proportion of children retarded in the grades of the Boston public schools for the past three years including in these figures those kept back in their school work for any reason, including illness, changes from private and other schools, as well as a certain amount of retardation caused by the recent change from a course of nine grades to one of eight grades below the high school, we find in 1909 8.7 per cent. of all the pupils. The greatest proportion of these retardations as found in the first primary grade where there were 17.3 per cent. while the proportion for the remaining grades, if the first grade was omitted, fell to about 7 per cent. Of these retarded pupils in 1909, the masters reported 4.2 per cent. as being slow in their studies from inattention or from mental deficiency. Those considered by the masters as mentally deficient were 361 in number, or about 0.5 per cent., not including 116 children enrolled in the special classes for backward children.

In 1910 the figures were 8,496 retarded pupils in 80,770 in these grades below the high school, and of these 8,496 they classed 880 as mentally deficient, a fraction less than 1.1 per cent. of all the children enrolled.

The classification by the teachers, however, gave somewhat different figures. According to their reports in June, 1910, there were 80,908 children in attendance in the primary grades, and 10.5 per cent. of these were retarded—in all, 8,496. The causes were given as follows:

Illness—infectious diseases, etc.	1,252
Absence (home work, truancy, etc.)	468
Entered school late	650
Entered from other schools	405
Repeated change of schools	181
Recently from foreign countries	331
Promoted on trial at beginning of year	239
Defective hearing	83
Defective vision	241
Defective speech	53
Deformities	31
Lazy	538
Inattentive	495
Mentally deficient	369
Mentally immature (slow mental development)	2,803
Cause unknown	196
Adenoids	13
Nervous	7
Cigarette smokers	14
Miscellaneous	127
	8,496

Of these 55.4 per cent. were boys and 44.6 per cent. girls.

In 1911 (June), of 89,199 scholars in the primary grades, 10,668 failed of promotion, of which 2,339 were in the first grade.

During the past school year, beginning in 1911, the number of special classes in the Boston public schools for backward children was greatly increased. In September, 1911, there were nine such classes, while during the school year ten more were started. At the present time in these special classes there are 101 boys and 91 girls, 192 in all. In addition there are 100 more children who have been examined and assigned to special classes when these are started. In addition during this past year 92 boys and 38 girls, 130 in all, were rejected for admission to the special classes as being of too low mental grade. Of these 26 have been assigned to the State School for Feeble Minded at Waverly, and 5 are known to be out of school upon the streets.

The number reported in the schools as being probably suitable for the special classes, but not yet in them, in addition to the figures given, is 454 boys and 234 girls, or 688 in all. Dr. Jelly, the special examiner in mental deficiency for the Boston School Board, also writes me: "I have received from teachers of special classes (whose judgment is undoubtedly more correct about mental defect than masters' and grade teachers', or nurses') report that they know about 200 cases in the schools that should be sent to the State School at Waverly or Wrentham."

I wish to thank Dr. Harrington, chief medical inspector of the Boston School Board and Dr. A. C. Jelly, the special examiner, for their kindness in providing me the above figures and much valuable information.

In considering these figures there are one or two points to which I wish especially to call your attention. First, that these figures include not at all the total proportion of imbecile children in the community, but only those where the mental defect has been so slight that it has been overlooked by the family and others, or where the parents have hoped the child could learn in the public schools. That is, of the 330 or more children now in the public schools of Boston who should probably be sent to a state institution, there are probably none of the idiotic or very low grade imbecile classes. On the other hand I think the opinion of those who have had special experience in examining the high-grade imbecile justifies us in considering that a large proportion of the children reported by the masters as retarded because of inattention, laziness, and immaturity, are undoubtedly imbecile.

Of course we all admit that it is difficult to define what is meant by mental deficiency just as it is difficult to define what is meant by mental disease. Practically however, in relation to education it is of the greatest importance—and for two reasons. The first is that undoubtedly the presence in the graded schools of children who are mentally deficient tends to retard somewhat the progress of the other children, while the effect upon their morals and manners of having such a child about who may be the object of their propensities for teasing, tormenting, ridicule; and even cruelty, need only to be spoken of to be recognized. On the other hand the prospect of such a defective child advancing in useful education in the general classes is almost nil.

It is the recognition of these evils that have led to the establishment in Boston of the so-called special classes to which it is planned to assign all cases of mentally defective pupils who show some promise of being improvable. The masters reported in the year 1911 in the special classes, 125 as improvable, 29 as unimprovable. Not in the special classes, improvable 516, unimprovable 142. Not in school and probably not improvable 49—a total of 861.

Lapage in his recent book upon Feeble Mindedness in Children of School Age gives some valuable statistics from the English schools. These figures were obtained from a series of investigations in regard to defective children by societies and commissions which were very complete. In these statistics, particularly those from the Royal Commission on the Care and Control of the Feeble Minded in 1908, it was found that, exclusive of insane, 1 in 217 or 0.46 per cent. of the population were mentally deficient, idiotic, imbecile, feeble minded, or moral imbeciles. The proportion in the schools were higher, probably because many of these children die earlier in life than normal persons. Here the proportion was 1 : 127, or 0.79 per cent., and larger in cities than in rural communities, the former being estimated at 1 per cent. and the latter at 0.5 per cent. Of 436,833 children registered in the schools, 3,437 were mentally defective, and of these it was estimated that at least 75 per cent. or 2,590 needed special provision made for them. This means, if the same proportions hold true for other parts of England as in those examined, that in England and Wales there are 47,515 defective children on the school register out of 6,044,394 registered, and 35,804 of these needing provision, and it should be noted that these figures do not include all defectives, as the worse cases are not on the register. In the same investigation of 2,353 prisoners, 242 or 10.28 per cent. were found to be mentally deficient, and 62.7 per cent. of habitual inebriates who were examined. As to the results of training in institutions for the care of imbeciles, the figures of Dr. Caldecott, of the Earlswood Institution, are of interest. He states that approximately one fifth of the inmates are high-grade, trainable imbeciles. Of 341 cases discharged in 15 years, 3.25 per cent. were earning wages, 3.81 per cent. were at home and very useful, 7.5 per cent. at home and useful, while 85.5 per cent. had proved to be of no use and should have been taken care of for life. At Lancaster 37 per cent. of the cases were high-grade imbeciles. Of those discharged 9 per cent. were earning wages, 33.5 per cent. were at home, and 40.3 per cent. were in work houses or asylums and it was concluded none of the cases should have gone out into the world. The After Care Commission of Birmingham reported in 1910 after nine years of investigation that of 650 cases 18 per cent. were doing remunerative work while 65 per cent., at least, were not. The employment bureau after four years of work had been given up because of the impossibility of obtaining and retaining ordinary situations for any but an extremely limited number of their high-grade cases. Situations may be found but the feeble minded do not retain them especially when they get older and the difference between them and their fellows is accentuated.

In deciding whether a child is mentally deficient, as has been said, there are various difficulties. First of all, of course, is the question of deciding what is that indefinite thing which we call normal. Usually we mean by normal merely the average, and a child may not do as well as others in school work either from falling below the average in mentality, or on the other hand from mental onesidedness. Then too, there is the difficulty that in all psychical matters there is a lack of very definite measures of the capacity. We can test certain things in this field, but not the mind as a whole. However, we may not go far astray if we consider a mind normal, as in the case of other organs, when it is capable of fulfilling its function and the function of mind in the human being may be briefly expressed for our purpose as enabling the person to accommodate himself to his surroundings and to protect himself. A person is mentally sound who is capable of leading a useful life and this is as true of children in their relation to education as it is of all persons in their wider social relationships, the difference being that of a child we demand only what its age warrants. Schools are planned for the average, but we must remember that testing a child's knowledge is not all, and that in considering the effect of the mental development upon the person's adaptability and fitness in life, we must consider also the feelings, impulses, and the will. Usually these qualities of the mind are considered to be voluntary matters, and defects in this region are regarded as moral obliquities or reprehensible weakness. But while this is true in part it is not wholly true, and we find that the training of the will may have its limits, even as the understanding and intellectual ability have theirs. We are safe in assuming that the child will show its fitness for life if it has half way proper external conditions and be capable, not only of performing its tasks of the time, but also show the capacity for being trained for a useful and rational life. If this training causes marked difficulties or requires extraordinary methods, then one is justified with the greatest probability in assuming that the child is mentally abnormal. To judge properly of abnormality, however, we must consider the whole history, the origin and social position of the child, the influences with which it has been surrounded and brought up, former illnesses, as well as take into account the results of the physical and mental examination, and at times prolonged observation is necessary in addition in order to arrive at correct conclusions. In general the child's teacher sees that he does not learn easily and has difficulty in understanding things, is easily distracted, inattentive, indifferent, not well behaved either in or out of the class room, and perhaps most important of all develops entirely differently from its brothers and sisters who have had the same surroundings and are being trained and taught by the same people. In judging of a child or grown person's mentality the untrained see either too much or too little, while the half trained are apt to see too much and regard as abnormal what is the result of surroundings and example, or of perverse will, where the person has been badly brought up, neglected, or is lazy. The ignorant person does not recognize that in judging of mental abnormality a single thing when considered by itself may be precisely what is seen in normal persons and so think the same explanation and the same treatment indicated. In the psychical field a single act, instance, or symptom usually means nothing, and its significance can only be recognized when it is judged in its relation to other facts.

Nor must we forget that psychical anomalies are much more common than mental disease, and many high-grade imbeciles, and psychopathic persons in all ranks and classes go through life misunderstood, most of them with no insight into their own condition, while others feel that they differ from the majority of their fellow creatures. Many of these abnormal persons as children are abused, and at all ages their peculiarities are apt to make them unlovable. Most of such persons do not end in institutions either for the insane or the imbecile, but they are found in large numbers in prisons, poor houses, reformatories and homes for drunkards. Environment makes no child feeble minded or constitutionally inferior.

What has been said in regard to mental deficiency considered in its wider aspects as applying to the qualities of the mind which are necessary for the proper development of character, as well as to the more purely intellectual qualities of the mind, applies with equal force to what, as I take it, we mean when we speak of constitutional inferiority, and most of what I have just said would have to be repeated in speaking of this aspect of the question.

The classification of the forms of constitutional inferiority can be varied almost indefinitely with the point of view with which the subject is regarded. Abnormalities of character are seen in various mental diseases, and also in many nervous diseases, as hysteria, epilepsy, and chorea for example, in some instances as temporary phenomena, and in others as permanent ones, as is so often seen in hysteria and epilepsy, and in both these diseases the abnormal mental states which occur as occasional causes of crimes are particularly well known, such as the false accusations of hysterics, and the crimes of violence committed in the temporary confusional states of epileptics to mention single striking examples. In general, however, when we speak of constitutional inferiority, we have in mind rather inborn mental abnormalities, more or less permanent, which have affected the person's character and mental make-up in such a way as to have interfered with his proper development in fitness for living a useful life, and these abnormalities are comprised largely under the group of psychopathies, or better, psychopathic inferiorities. The subdivisions of this group are somewhat indefinite, and in almost any classification we find more or less overlapping of groups or combinations of types. It has seemed to me that perhaps as satisfactory a grouping of these psychopathics as any is that of Scholz, as given in his recent book, Anormale Kinder.

In this classification I leave out the feeble minded, the simple nervousness, or nervous excitability, neurasthenia, hysteria, epilepsy and chorea, in all of which abnormal psychical symptoms occur, but which are perhaps better separated from the strict psychopathies, reserving this term more for the abnormal states seen upon a constitutional basis, not implying, however, that these are necessarily permanent.

We may divide then the psychopathies according to the dominant characteristics into the following types: (1) The indolent, (2) the depressed, (3) the maniacal, (4) the periodic, (5) the emotional, (6) the impulsive, (7) the unstable, (8) the perverse, (9) the phantastic, (10) the imperative, (11) the moral defective, (12) the sexual.

These classes of abnormal mental characteristics are essentially always borderline cases between mental disease and mental soundness, and as you see may include many of the mental symptoms that occur either transitionally or permanently in such cases as the merely excitable child, hysteria, epileptics and perhaps others. We should remember, however, that in considering the individual case which may show certain of the characteristics of these groups, we must not give too much weight to peculiarities, as these are not sufficient to warrant conclusions of a psychopathic state, but peculiarities must be judged in relation to the whole character, and there must be a definite irregularity in the development of psychical functions.

These psychopathic types of character may also be acquired, under various influences, of which the most important is that of alcoholism, or again as frequently seen in those who have suffered an attack of mental disease from which they are supposed to have recovered, but who are never able again quite to fit into normal life as they were before their illness. Many of these psychopaths are talented, but onesided, of whom people say, how much that man could accomplish if he were only willing to restrain himself, characteristics which are so common that they justify the saying of Josh Billings that he would rather see his daughter marry a porcupine than a genius. In this type of person, as is also the case with the slighter grades of feeble mindedness, the social position and the possession of wealth, especially where this has been beyond the control of the individual himself, often makes the chief difference in the outcome. It is the poor and untalented chiefly among the psychopathic whose end is so often a tragedy.

In these types, too, we trace distinctly in many instances the resemblance to the common types of insanity, many being probably merely abortive insanities, though it by no means follows that persons of these particular psychopathic types are certain or even very likely to develop in time true insanities. Uncontrolable anger may become mania; anxiety dread; fear and suspicion increase to delusions; or the play of fancy becomes illusions, but by no means necessarily. In children particularly we find simpler examples of these psychopathic characteristics, and they may be temporary, especially those appearing about the time of puberty and even the severe cases by no means always end in insanity.

1. Of the indolent psychopath, the apathetic feeble minded child is the type which they most closely resemble. They show lack of interest and enthusiasm both in regard to work and play, are contented with themselves, and are uninfluenced by praise or blame. They resemble in many respects the onset of the hebephrenic type of dementia præcox. When this indifference is partial, for certain things only, we approach the normal, as every person has his particular lines of interest, thought and feeling, which may be natural or acquired.

2. The depressed. A child with no happy moments we regard as abnormal, as a characteristic of children is that their sorrows are short lived, and they live only in the moment, certainly as regards the feeling tone. This type is often seen as a transitory phase at puberty, when happiness may be found in unhappiness, but this passes, and we may regard as pathological the cases where it becomes permanent, and with passing years and increased experience the person fails to recognize their foolishness.

3. The maniacal type. By this form we mean those who show excessive and continued unrest both mental and physical, who as children are unable to listen for the end of a story, in school are restless and unmanageable and inattentive. The essential characteristic is the lack of need of rest.

4. The periodic shows on the contrary an alternation of depression and activity, which is unnatural and excessive, and usually without evident cause. Here we do not as a rule see any distinct periodicity as to time in the mood alterations. In

these cases as in most of the psychopathics we find that punishment aggravates the trouble instead of helping.

5. The emotional type is marked chiefly by outbreaks of feeling which are transitory. Here again the criterion of abnormality must be in the disproportion between cause and effect. Not only is the cause apt to be trifling, while more important causes may produce no reaction, but in addition the reaction is excessive, the small child loses its breath when in a rage, turns purple, and perhaps becomes unconscious. Such outbreaks are not confined to those of rage only and when these characteristics are present must be due to temporary causes, or have a constitutional basis, or be the result of idiocy, epilepsy or hysteria. Terror and anger are the most important affects seen.

6. Impulsives. Here we have to deal with single motives, though this may not be clear, while in voluntary things the motive is multiple, and we also mean impulses to actions, not to single acts, as in the tics. The commonest is the impulse to run away. In normal children this is seen in the impulse to follow a hand organ, a band or circus. When arising from within only, we get the wandering away from good homes, which give us many of our vagabonds, tramps and prostitutes. Here probably belong certain of the old monomaniacs, as kleptomaniacs, pyromaniacs and others, though we should remember that these things are symptoms and not diseases, and mean generally psychopathies, epilepsy, hysteria, imbecility, or insanity as dementia paralytica. We must remember too that others have impulses but oppose them, as drinkers. An impulse too which is natural at three years is often pathological for a child of ten. The imperative impulse may lead to mania for collecting, often of useless or disgusting things, and is seen most often in the feeble minded and may lead to theft; and this is also true of incendiarism, but here we should seek carefully for motives which may be in homesickness, anxiety or fear and is frequently connected with alcoholism. Murderous impulses are rare, aside from those in epileptic states, and when seen are most frequently the expression of cruelty, particularly in the feeble minded, or upon a sadistic basis with congenital moral defect, and in childhood it should not be forgotten that this is usually replaced by cruelty to animals.

7. The unstable are characterized by the absence of any constant psychical tone, the ephemeral type of person, changeable

and unreliable. These may get through the schools after a fashion, but fail to adapt themselves to life afterwards. Often entertaining, amusing, with signs of talent, they continually change occupation, are never to blame, become in the better classes the dilettants of life and in the lower, the beggars and vagabonds.

8. The perverse type reminds us of the paranoiac. As children they may cherish fancies, as that they are of high estate by birth, while later they frequently become hypochondriacs or persons who believe only their point of view is right, and augment the ranks of spiritualists, free lovers, women suffragists, anti-vaccinationists, anti-vivisectionists, vegetarians, homeopaths and faddists in general, persons whom laws only irritate. As Goethe says the most foolish of the erring are those who, with good heads, think they have lost their originality when they accept as truth, what has been already recognized as true by others.

9. Phantastics and liars. Here we deal with an exaggeration of what is normal. Psychology has shown that most persons are poor observers, what we perceive being modified and interpreted, and so changed. This is also more marked in children, who in speaking their fancies often actually lie. The normal child, however, does distinguish between reality and his day dreams, and does not lose himself, though these characteristics usually increase as love and sex impulse develops. These characteristics may be considered pathological when fantasies and lies become necessary to the individual and the occasions are manufactured. This is seen in its purest forms in the hysterical, epileptic and feeble minded, but also in degenerates, drinkers, morphinists, and not infrequently in the talented and may be periodic.

10. The imperative. Here again we have our analogue in the normal, and the imperative is related to the impulsive only the impulse is more momentary in the latter. In the imperative there is more a feeling of compulsion, and it is united with feelings of discomfort or connected with fears, scruples and doubts. This seldom leads to crimes which are seen more in the impulsive type, but is frequently seen as a symptom in imbecility and hysteria.

11. Moral defectives. This type again appears as a symptom

in the feeble minded and in insanities, and the question arises whether such character defects are possible without mental defect. Usually some intellectual defect can be found, but the real question is whether moral inferiority can be of pathological origin, and to this we must give an affirmative answer. Moral anesthesia is a better term and we must recognize that mind and morals are not similar qualities. The defect seems more one of will, and feeling is absent. We may distinguish an erethritic and a torpid type. In these superficiality of thought is characteristic. The child is cruel to others, lies, steals, plays truant, is troublesome and a mischief maker in school, and most essential of all, neither persuasion, example, nor punishment has any effect. The course depends somewhat upon circumstances. At times they develop into hoodlums, members of gangs, apaches, and prostitutes, while among the richer classes, we find these dismissed from school after school, borrowers from inferiors, these living openly immoral lives with no feeling of shame or regard for their families. Congenital forms or acquired forms are difficult to distinguish, but pathological instances are probably exceptional.

12. The sexual psychopathies form a difficult group to distinguish. At first sex impulses are vague and undifferentiated, being actuated more by mere curiosity. Differentiation comes usually soon after puberty in the neighborhood of fifteen years, but may be considerably later. Homosexuality is not always present even in the most intimate friendships of young people of the same sex. Sexual crime in itself does not prove a defective mental state, and homosexuality is not a disease phenomenon, nor directly a symptom of constitutional inferiority, though it may be a symptom of this. Other sexual anomalies than homosexuality, which may appear on a psychopathic basis, are the combination of cruelty with lust. The sexual anomalies of the feeble minded do not represent immorality or perversion of the instinct.

It is easy to see how children of these various types of which we have been speaking are handicapped in life and become difficult to educate in the ordinary schools. They form a considerable proportion, not so much of retarded children, as the unmanageable, the truants, the bad boys. Certain types, however, as the indolent type, may be backward in school from mere lack of interest and inattention.

From these classes, the psychopathic person and the feeble minded of all grades, as well as occasionally from epileptics and hysterics, we find a certain proportion of our criminals, both occasional and habitual, though more often these abnormal psychical traits lead to such things as vagabondage and chronic alcoholism, drug habits, or something of this nature, rather than to law breaking. We can easily see from the characteristics of the various types of abnormal persons that certain ones lead more directly than others to crimes and usually to crimes of a certain type.

Certain types are, for example responsible for some of the suicides, especially child suicides. Eulenberg analyzed the cases of child suicide in Prussia for the years 1880 to 1903, and found the number not increasing, averaging 54 a year in school children, and he classified the causes in these cases as hebephrenia, confusional states, psychopathies, feeble mindedness, which caused many of the cases, and more rarely imitation, while a few were from sexual causes.

The depressed type of psychopath tends chiefly to suicide. The maniacal type results mostly in alcoholism, sexual irregularities, and swindling. The emotional mostly produces such things as slandering letters, incendiarism, occasionally suicide, violence to others, wanton destructiveness, or senseless running away, accidental circumstances seeming often to determine the character of the offense. The impulsive psychopath in crime tends mostly to theft, or running away, which in older persons may of course determine a life of vagabond, tramp, or prostitute, these forming chiefly the group who cannot be retained in institutions even by force. Some spendthrifts, drunkards, and gamblers belong here. The question often almost impossible to answer being where does disease begin. Murderous impulses are rare and probably belong to the epileptic confusional states, or the imperative type of psychopath, and here more frequently in connection with cruelty and frequently with a sadistic basis, and then usually combined with a congenital moral defect, and a bad mode of life. The unstable person tends chiefly to vagabondage, begging and alcoholism. Our perverse type of psychopath seldom leads to crime and the same is true of the imperative type of psychopath, aside from suicide. The moral defectives are perhaps the most frequent criminals. The erethritic type tending chiefly to brutality, lying, stealing, truancy and vagabondage, often ending in the apache of the French, the hooligan of the English, or our hoodlum gang, or in the case of girls, in prostitution. The sexual type of psychopath seldom tends to crime, unless perhaps in the homosexual habits, the most sexual crimes when on a psychopathic basis having one of the other types of psychopathy underlying it as a rule, or feeble mindedness. The imbecile who uses children or animals is neither immoral nor perverse and is almost universally a boy, the reason being chiefly because girls will have nothing to do with him, while the female imbecile has no such difficulty. In regard to the frequency of crimes in relation to imbecility and constitutional inferiority, I can give you little first hand information. Juvenile courts have been established in Boston for about three or four years and of the cases brought before this court, only those are referred to physicians for examination where the circumstances of the crime seem out of the ordinary to the court. Dr. Lane, who has examined these children for the courts tells me that of those sent to him for examination almost one-fourth are of such grade of imbecility as to require to be sent to institutions for such cases, and undoubtedly, as in backwardness in school children, a still larger proportion would show slighter grades of imbecility.

Rupprecht has recently analyzed the crimes of children in Munich for the year 1909. In a population of about 600,000, 51,000 were of the ages 12 to 18, and of the arrests 2,444 were for minor offenses as breaking public ordinances, and 456 were for breaking and entering, or greater offenses. The proportion of crime to population being 5 per cent. in youths and 11 per cent. among adults.

Of these arrests 307 were for begging, 700 for theft, 2 for cruelty to animals, 12 assaults, 12 for immoral actions, most of the offenders being feeble minded, 4 for rape, 5 for pederasty, 3 for supporting themselves upon the earnings of prostitutes. Arrests for drunkenness were rare, and almost exclusively in those near the age of eighteen years.

Of the approximately 2,500 arrests for minor offenses 1,258 were in young persons, 16 or older, who had left home and were supporting themselves; 411 were school children from 12 to 14; 384 apprentices; and 272 servant maids. The parents in 36 cases were of the upper classes; in 579, persons having their own business; in 322, in the class of skilled workmen, and in 1,454 they belonged to the laboring class. From about a thousand of the cases it was found that in 121 mental defects or real imbecility played a part, while hysteria, psychopathy, and lack of insight made up the remainder.

The remedies for these conditions which I have tried to sketch, I shall dwell upon only briefly. Those of slighter degree of mental defect, with training and under supervision, may prove fairly useful members of the community. Special classes in the schools such as have been formed in the Boston schools often give children of this type the necessary education. These classes require, however, to be under medical supervision and that of a physician trained in the examination for mental defect in children, in order to prevent them from being filled with unimprovable imbeciles. Probably very few of even the milder cases of imbecility are ever capable of fully managing their own lives, but require life long care, either of friends or guardians, or institutional care. Many of our criminals, both the feeble minded and psychopathic type, also, are incapable of self direction and a certain proportion of them, certainly the feeble minded, should be permanently segregated. Sterilization as a method of treatment solves only a part of the problem, that of inheritance of the abnormal psychical nature, and not at all the influence of the particular defective upon others, which has many and widespreading ramifications. Our aim as neurologists at the present time should be to arouse the community to the appreciation of the facts and to urge proper medical supervision of schools and courts, where these abnormal cases can be found and the needs of the individual case determined if possible. Special schools or special classes which will withdraw the constitutionally inferior from association with normal children in the schools are desirable for the sake, both of the abnormal and the normal child; and, for the psychopathic criminal as for the feeble minded, permanent guardianship of some sort in or outside of institutions is probably necessary.

LOCALIZED ENCEPHALITIS OF THE LEFT MOTOR CORTICAL REGION WITH EPILEPSIA CONTINUA[1]

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The object of this paper is to report a case of encephalitis which, on account of its peculiar localization and its partial epileptic convulsion of the Jacksonian type, calls to mind the two cases published by Mills. This case, however, differs from the latter in its interesting pathological and anatomical changes and in its odd symptoms of epilepsia continua,[2] viz.: That with the exception of one general epileptic seizure, the patient presented clonic convulsions of separate muscle groups which continued with equal frequency for twenty days until fatal termination.

Case

M. H., girl, 14 years, born in Vienna and lately residing in a small market town situated in the Alps, in the vicinity of Vienna. To the knowledge of the family, no infectious diseases were in the locality for two months preceding the onset of the patient's present illness.

Father and mother both well. Patient healthy until present complaint; birth and early childhood normal; no rickets nor convulsions; intelligence apparently normal; good pupil at school; finished eighth grade.

May 1, 1911, date of onset of present disease. Patient complained of headache and tired feeling. Her family noticed her to be unusually irritable and at times to fall into fits of unreasonable laughter.

[1] From the Psychiatric and Neurological Clinic of the K. K. University of Vienna (head, Hofrat Prof. Dr. Julius Wagner V. Jauregg). Read before the Chicago Neurological Society, November 21st, 1912.

[2] The term epilepsia continua was originated by Koschewnikew and was soon attacked in a monograph by Choroschko. While Koschewnikew takes the cortex as the source of the symptom, the latter places the lesion in the subcortical region. This case, like many others, points clearly to its cortical localization. To my knowledge, the case of epilepsia partialis continua by Spiller and Martin is thus far the only one reported in English literature.

May 2 and 3, patient remained in bed without presenting any additional symptoms. Fever not noticed.

May 4, developed clonic convulsions in the right hand which persisted continually thereafter, awake and asleep. Convulsions not accompanied by any loss of consciousness; memory, however, was slightly impaired. The character of the contractions was described to consist of short lightning-like dorsal flexions and pronations with barely a half minute interval between them.

May 7, contractions in right angle of mouth in addition to those in hand, presenting similar character, frequency and persistency. In connection with the spread of the spasm, the family noticed that patient became listless and speech indistinct. Her hearing was believed to be impaired by reason of her faulty responses to questions and suggestions. Subsequent night, patient was intermittently delirious, repeatedly trying to arise to go to school. Fever was at no time observed by the family.

May 15 (noon), she was brought to the clinic. Temperature was slightly elevated (37.4° C.). During the early days of observation morning temperature was higher (37° C. A. M.; 36.6° P. M.), but on the fifth day this reverse character of temperature changed.

On first examination patient lay supine, except for the presence of the epilepsia continua; she did not speak voluntarily and responded with few words, only after continual questioning and stimulation. Speech apparently difficult, low and indistinct. Struggled at times in her efforts to leave the bed. Could stand comparatively well and walk without staggering, but on a somewhat wider base. In walking she slightly dragged right leg. Active and passive motions in the upper left extremity normal, while right arm when raised fell powerlessly. The right leg only slightly weaker than left; muscle tone markedly diminished in all four extremities, but more so on right side. In the upper extremity the tendon and periosteum reflexes absent; patellar reflexes equally weak on both sides and obtainable only during the convulsions. Achilles-tendon reflex bilaterally more constant and responded more easily than patellar; an indistinct, positive Babinski on right side; abdominal-reflex absent on both sides; Quintus reflex weak on both sides; no analgesia; but in distal parts of extremities the reaction to needle pricks was weak. The more delicate tests of the various sensations could not be carried out, because the patient did not react to light touches at all and to other stimuli she became exhausted after responding once or twice. The thermal sense (tested repeatedly) was intact. During examination contractions continued.

The night of May 15, patient was given amyl hydrat 4.0, affording her a few hours' sleep, during which the frequency of contractions did not diminish, but their excursion was smaller and their lightning-like character possibly less distinct. Left hand and leg which presented a mild chorea while awake were quiet during sleep.

When awake contractions were extremely clonic and lightning-like. Beginning in the orbicularis oris and quadratus menti, and within barely half a second followed by extension and slight pronation of hand, occasionally terminating in a slight rapid contraction of right leg. The character of the return curve of the contractions simulated the curve of the "pulsus bigeminus"; a successive interchange of stronger and weaker contractions.

May 16, psychic condition and speech could be tested only at intervals, because patient passed into perseveration after two or three reactions and soon ceased to respond. After taking considerable pains to induce patient to speak she pronounced a few badly articulated words with great difficulty. The tongue could be protruded after marked effort only and not beyond the teeth. The motor innervation of the facial was bilaterally equal. The more delicate differences could not be taken on account of the continuous contractions, numbering about 30 per minute.

Spontaneous mimism and response to requests to laugh, cry, etc., were absent. Expressed pain pantomimically. On prolonged observation spontaneous speech noticed at rare times, but only on requesting a drink (water, milk). Of all questions put she answered only that referring to her condition, and always with the stereotyped word "better."

The patient obeyed only the first of the very simplest directions, such as closing eyes or extending left hand, all further action substituted by mixture of perseveration.

On strong stimulation she could recognize the first two or three simple and familiar objects, then passed into perseveration; for instance, she would name correctly a watch and pencil, further articles shown would elicit the word "pencil"; she could never be induced to read or write, nor to perform any more complicated actions. The various mechanisms of the principal movements, walking, standing, sitting, bending, etc., were undisturbed; no hemianopsia; lid-closure reflex was equally prompt bilaterally; the patient could fix the eyes comparatively well from both peripheral halves of the visual field. The eyes moved synchronously and freely in all directions and without nystagmus. The pupils were equal and reacted promptly to light and to pain.

The sense of smell tested with ammonia was indicated by simple turn of the head. The test of taste sense was difficult and resulted barely in any reaction, no response to the ticking of a pocket watch, but to the rattling of keys slight turning of the head. Ophthalmoscopic examination (Priv. Docent Dr. Ulbrech) found fundus normal. Roentgen examination of the skull (Priv. Doc. Dr. Schüller) essentially negative; hydrocephalus, cranium 3 mm. thick and spongy; inner surface even; base normal.

Lungs and abdominal viscera normal. On rectal irrigation a mushy stool (milk diet). Pulse of left radial, 90; no special fluctuation in its rate; no attacks of tachycardia; fairly audible and clear heart sounds; rhythmic cardiac action, not greatly influenced by the clonic convulsions.

May 17, at night; amyl hydrate was given 4.0; patient slept few hours. The contractions same as day before but at 10 A. M. developed a general epileptic seizure; at first the head, then the eyes deviated to left; pupils dilated but not rigid; face at first pale, then cyanotic; froth at mouth. The clonic convulsions began in the left facial but very rapidly became generalized and continued for about two minutes. The tendon reflex and Babinski negative during and after seizure. But soon the epilepsia continua returned, the contractions of which, however, assumed to some extent a new phase; the orbicularis oris and the extensors of the right hand contracting simultaneously and more forcibly followed by a *bilaterally symmetrical* contraction of the muscles of the forehead and orbicularis palpebrarum. About noon patient developed a marked universal dermatographia, but no other meningeal symptoms. When assisted was able to sit up fairly well; could stand up without staggering. In walking crossed legs and dragged the left foot more than ever; there was also a right horizontal nystagmus and weak, incomplete closure of eyelids. No tendency to deviation of bulbs. Needle prick test positive all over body; deep sensibility could not be tested; stereognostic sense was absent in right hand.

The abdominal reflexes absent bilaterally, plantar-reflexes present but weak, trigeminal reflex present on both sides. In the afternoon, left lid-closure reflex prompter than right. Patient somewhat livelier and sat up frequently. At one time sat up voluntarily and asked for milk. The word " milk " was disarthric and expressed with great difficulty. All attempts to induce further speech unsuccessful but simple directions such as opening and closing eyes, giving left hand, obeyed promptly, without perseveration. On request to protrude tongue she opened mouth without moving the tongue, but several seconds later she thrust out tongue spontaneously without deviation.

On taking nourishment the cup had to be held; liquids at times regurgitated; milk gruel taken more easily than plain milk.

At noon amyl hydrat 4.0 administered; intensity of contractions diminished. After 11 P. M. patient fell into deep slumber during which contractions were limited to fingers.

May 18, patient awoke about 7 A. M. but remained somnolent all forenoon and, on taking nourishment, repeatedly misswallowed. No change in the general findings and epilepsia continua except that the contractions of lower facial and of extremities occurred simultaneously. Bilateral contraction of upper facial stronger and without regular interval.

May 19, findings same as before, but patient did not shut eyelids spontaneously and only partly on request; associative eye movement to right occurred in jerks, to the left and down eyes moved freely; in sitting posture she fell to right side; standing and walking were no longer possible; marked weakness.

At noon lumbar puncture was made; pain during passage of needle; pressure of spinal fluid, measured with Quinke tube, raised to between 130 and 180 mm. water; liquor clear; albumin slightly increased (2½ Nissl Essbach). Nonne-Apelt globulin reaction negative. Lactic and meat acid tests negative; Fehling's test reduced large quantity of sediment; dextral turning of polarization scale equal to 0.3 per cent. grape sugar; microscopically, very few round cells found.

May 20, patient developed bronchitis and cardiac weakness. Digitalin injections 1½ c.c. pro die. At 4 P. M. patient developed a temperature of 37.4° C., declining at night to 36.5° C.; pulse-rate increased to 140; nerve findings, convulsions, and paralysis same as day before but bulbs tended to deviate to left; patient completely speechless, but still obeyed simple directions.

May 21, temperature 36.2° A. M., 37° P. M.; in addition to clonic convulsions, rhythmic contractions of head and eyes appeared; the contractions occurred in the following order: right lower facial and right hand; upper facial (*bilaterally symmetrical*) followed immediately by turning of head to right to angle of 60°, then by jerky conjugate eye movements to right; the latter, however, did not reach extreme canthus, but only a point midway between extreme and middle position of eye. The whole series of contractions did not last quite two seconds and were repeated fifteen times per minute. During the short intervals between the clonic contractions the eyes deviated to left the same distance as to right during convulsions.

Muscular hypotonicity not changed; right-sided paresis became more complete; patient could no longer be examined on account of her psychic condition but still reacted to pain; with exception of dermatographia there was no evidence of meningeal involvement.

May 22, evening temperature 37.4° C.-36.5° C., bronchitis aggravated; pulse 152 and of low tension; no arhythmia; general condition not changed; contractions lost their usual succession; first head to right, then eyes turning to right, then all other conractions appearing simultaneously; character of contractions same.

May 23, morning temperature 38.1° C.; midnight 39.6°; deep stupor. No reaction to needle pricks; pulse 160 and small; heart sounds weak; contractions presented same frequency but were stronger than day before; the dextral deviations of head and eyes were simultaneous and more extensive than before and followed by the other contractions; no general seizures; frequent mis-swallowing occurred in taking nourishment.

Therapeutic measures, amyl hydrat 4.0 by enemas twice daily; neuronal 2.5 per die, alternate days. Oxygen inhalation, oxygen baths and saline infusions had no apparent effect. Bromide and atropine were avoided on account of early appearance of tachycardia (or rather due to absence of vagus stimulation). Withdrawal every other day of about 5 to 15 c.c. spinal fluid had no influence on the epilepsia continua.

May 24, temperature 38.2° C. A. M., 39° C. P. M., rattling respiration; increased cyanosis, arhythmia, etc.; contractions retained character of day before but became weaker toward evening and soon after midnight the patient died.

The autopsy was performed May 25, 1911, by Priv. Doc. Dr. Wiesner. The brain as a whole was found to be somewhat edematous. Macroscopically, the leptomeninges presented no special changes. In the middle and lower third of the left anterior central convolution a distinct increased resistance could be distinguished. On section the cortex in this area appeared somewhat narrow, of a grayish pale color, while the cortex in the parietal region adjacent to this area was distinctly widened, somewhat succulent, grayish red and sprinkled with red dots and streaks. The other findings were of no essential interest.

Microscopical Examination (assisted by Dr. Otto Poetzl).—Cross section of the left second frontal convolution (Van Giesson).

The soft cerebral membranes show a slight increase of lymphocytes. The vessels are hyperemic, especially in the depth of the fissure; the lamina zonalis is fairly wide. The architecture of the deeper layer which can be distinctly seen with a low power is essentially unchanged. The hyperemia is but slight. No infiltration in vessel walls. The pyramidal layers present an abundance of glia cell nuclei. It cannot be positively ascertained with this technique whether there is any neuroglia fiber proliferation. The white substance is slightly edematous.

Nissl preparations show everywhere badly defined tigroid bodies and very many clearly visible capillaries with endothelial cells. Neurophagia is seen only in single spots. Cellular infiltration of vessel walls is completely absent.

Bielschowsky preparations show very wide pericellular spaces due to shrinkage of cells. The perinuclear fibrin bundles in the cells are massed together and honeycombed, while the peripheral fibrils appear like semicolons in place of the layer-like arrangement. The glia is not impregnated. The thicker axis cylinders show nothing special. The ground substance is spongy, blurred and pale violet.

Operculum Frontale.—Double stains show marked fresh changes, especially at the bottom of the fissure where also edema is most pronounced. The latter point shows an abundance of minute blood vessels, the walls of which consist of numerous crescent shaped cells with slightly swollen protoplasm and rod shaped nuclei. These vascular walls are surrounded by a small area filled with red blood corpuscles. In the neighborhood of these vessels the edema is in some spots very intense, thus forming circular paler stained areas.

At the top of the convolution there are a few miliary hemorrhages and a hyperemia, the latter being more pronounced than in the above described preparations. The capillaries appear as if injected throughout the whole cortex.

Nissl preparations, in the depth of the convolution, where the changes are pronounced, show many glia cell-nuclei in a state of mitosis; no increase of trabant cells of the large ganglia cells; the large and middle pyramidal cells show largely changes of acute disease in its various stages and a few of them have vacuoles in the very faintly stained homogeneous protoplasm; in other cells the protoplasm is disintegrated into minute granules. The swelling of the vascular endothelium is very distinct.

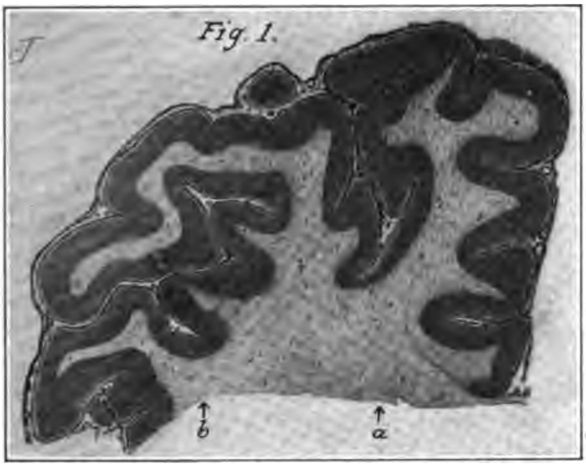

Fig. 1. Frontal section about ½ cm. anterior to operculum Rolandi. At (*a*) in depth of first frontal section pale netted area. At (*b*) in second and third convolutions similar encephalitic areas and hemorrhages.

Cornu Ammonis.—Of all the preparations this part of the cortex shows by far the most marked changes: Extensive hemorrhages break through all parts of the cortex. The process of glia fiber proliferation appears in every layer of the convolution. In some fields very darkly stained small round nuclei are gathered into groups, which extend as well along the branches of the small vessels. A multitude of minute hemorrhages resembling flea bites are readily seen on stained specimens with the naked eye.

In *Nissl* preparations the most striking findings are the numerous mitotic changes of the glia cells.

The examination of the spinal cord in its various levels shows only signs of light edema.

Marchi preparations of the medulla at the level of the pyramidal crossing and at the different levels of the spinal cord show numerous diffuse debris but no fat cells nor marks of fresh degeneration of system fiber tracks.

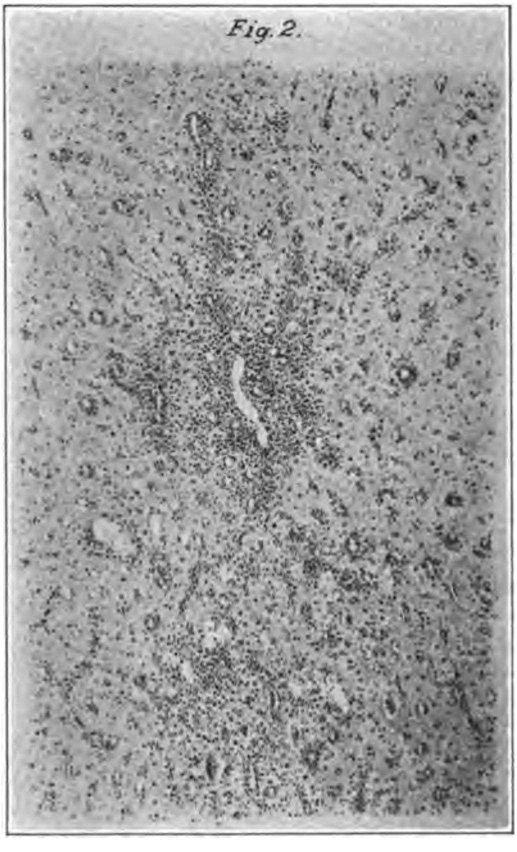

FIG. 2. Enlargement 20/1 of Fig. 1 (b), gliomatous meshwork, abundant nuclei, hyperemia, minute hemorrhages.

Review Preparations.—On the accompanying cut are illustrations of frontal sections through the convexity of the third frontal convolution at the foot of the convolutions, cut about ½ cm. frontal from operculum Rolandi. They show the distribution of exquisite miliary encephalitic areas, which are especially distinct in the depth of the convolution. In Fig. 1, at (*a*) in-depth of the first frontal fissure the pathological changes pass gradually from both sides of the fissure into the normal tissue. This cortical area can be distinguished macroscopically on account of its paler staining and net-like structure, the finer histological picture of which is shown at Fig. 2. At this point the pia shows a dense infiltration of lymphocytes around the blood vessels. The glia of the neurogliar layer is in a state of lively proliferation. Edema is pronounced, especially in the second cortical layer, and the vascular changes are similar to those above described.

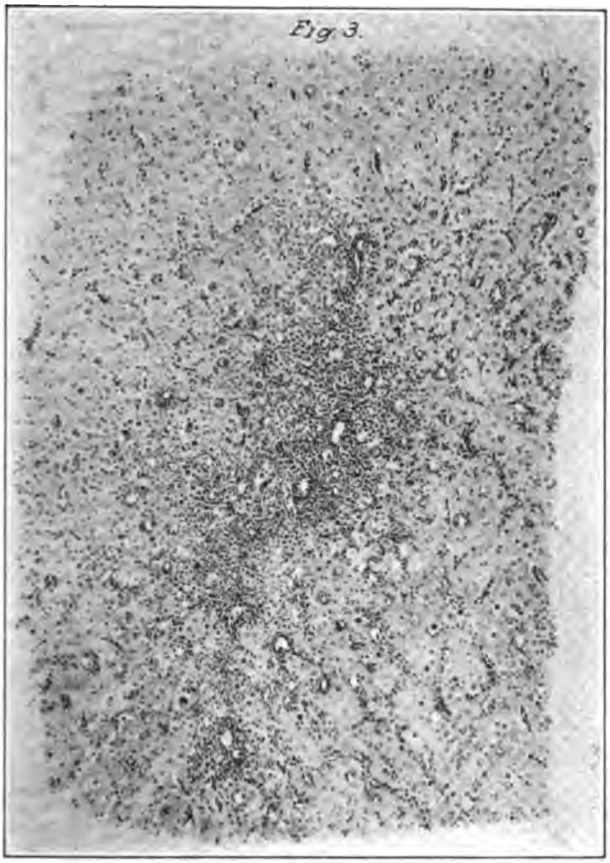

FIG. 3. Enlargement of Fig. 2.

At point (*b*) on each side of the fissure, between the second and third frontal convolutions, two round miliary areas which also, on account of the pale staining and net-like structure, are visible to the naked eye. Under the low power the upper area, situated in second frontal, is round and loose, presenting a wide meshwork containing abundant nuclei, marked hyperemia, and small hemorrhages. This is surrounded by a pale area, the vessels of which are more hyperemic than those more distant and which is studded with numerous hemorrhages. Under the same power, the lesion in third frontal (lying opposite the one just described) is wedge-shaped and extends throughout the width of the convolution from the deepest strata up to the stratum tangentiale. The latter cannot be particularly distinguished within 60–80 μ from the other part of the cortex neighboring this small lesion.

In addition the whole review preparation shows marked hyperemia and miliary hemorrhages of the cortex, white substance and leptomeninges. Briefly, findings of encephalitis hemorrhagica.

Fig. 2, with a 26/1 enlargement, shows a detail of this lesion at (*b*) in second frontal. Fig. 3 shows the same detail under a stronger power. The numerous vascular sprouts as well as the swelling of the vascular walls are seen in the zone of infiltration.

The findings above mentioned give, on the one hand, diffuse changes which answer to the usual picture of encephalitis hemorrhagica; but it is surprising to find the extraordinarily strong tendency toward division of the glia cell nuclei and still more striking is the tendency of the glia tissue to form new fibers. This latter tendency is especially noticeable in the miliary areas. The microscopic as well as macroscopic finding corresponds in reality to a rapid sclerosis of that cortical territory where the disease began. It is noteworthy that the cornu ammonis is very markedly affected and presents a rapid glia proliferation, which reminds one of the sclerosis of the cornu ammonis in epilepsy.

In reviewing the history of this case we are confronted at first glance with some diagnostic difficulty. We have before us a fourteen-year-old girl, apparently of normal constitution, except for a slight suggestion of infantilism. After a few days of uncertain prodromals she became ill with epilepsia continua, without any known cause. This singular symptom stood out preëminently throughout the disease and persisted until fatal termination. As a whole, fever played no rôle in the disease, the patient having presented only at rare times a slight elevation of temperature. The fever, which occurred toward the end, cannot be considered characteristic of the disease, as its course did not differ from fever in fatal cases of status epilepticus.

With the exception of taches cerebrales symptoms of meningeal irritation were absent. The cerebrospinal fluid having proved negative, the diagnosis of meningitis or meningo-encephalitis was excluded.

The presence of a tumor in the lower third of the motor cortical region, or pseudo-tumor cerebræ (Nonne), had to be excluded on account of the absence of pressure symptoms, negative ophthalmoscopic finding, etc., which also, to a great extent, ruled against cerebral tubercle; besides, this patient presented no symptoms of tuberculosis, such as glandular enlargements, osseous cicatrices, ocular fundus changes, pulmonary involvement, etc.

Likewise there were no symptoms to support the diagnosis of cerebral syphilis or meta-syphilis, Wassermann reaction in serum and in spinal fluid being negative.

Evidences of syphilis would have made it necessary to consider an exceptional case of juvenile progressive paralysis with pathological cortical changes (Lissauer), a disease in which, as we know, epilepsia continua occurs very frequently. (The microscopical findings show details which resemble certain rare forms of luetic encephalitis (compare the cases of Pötzl and Schüller), in which epilepsia continua is the chief symptom.)

Finally, an irregular form of idiopathic epilepsy had to be excluded, because the general picture of the disease did not conform with such diagnosis, especially since the tendency of the convulsions to become generalized was extremely slight. In idiopathic epilepsy the epileptic disposition, which is always presupposed, is chiefly characterized, in addition to the increased convulsions, by its tendency to depart from the Jacksonian type and to pass into rapid generalization. Our patient, however, developed only one general epileptic seizure (May 17), otherwise retaining strictly the Jacksonion type of convulsions for days and weeks. This latter type of convulsion is dependent upon the irritation of definite foci in the motor area of the cortex. The skipping of the irritant from one focus to another confines itself strictly to the architectural arrangement of the motor region. The stimulus stops at each focus comparatively a long time and requires relatively a long time to complete its course. As previously stated, our case presents, to a certain degree, a tendency to gradual generalization of the convulsions, but this tendency is unusually slow. Now, this slowness, this sameness of rhythm and stability of frequency distinguishes this case from the convulsions of idiopathic epilepsy and places it in that category of epilepsia continua which occurs in Lissauer's paralysis; in encephalitis hemorrhagica; in some cases of cerebral syphilis; in rare cases of cysticercus, and in isolated cases of pachymeningitis hemorrhagica.

In cases of pachymeningitis hemorrhagica muscular contractions, if at all present, are usually irregular and affect the motor cortical area of one or both hemispheres, constituting symptoms which resemble the clinical picture of paramyoclonus. Again, the clonic convulsions occurring in cysticercus cerebræ give the impression of being more irregular and tending toward rapid generalization. A functional paramyoclonus is readily excluded by the Jacksonian type of the contractions, and for the same reason the atypical form of chorea must be ruled out. The diagnosis of a circumscribed inflammation of the arachnoid (Kurt, Mendel, etc.) cannot explain this singular course of convulsions which steadily extended into the neighboring cortical territories.

With the above enumerated diseases we practically exhaust all that may be considered in differential diagnosis and leave as a substratum of the disease in question, a circumscribed, acute, non-suppurative encephalitis affecting chiefly the lower third of the motor region of the left hemisphere, beginning at the operculum Rolandi and extending upwards to about the foot of the second frontal convolution. The conclusion as to the character of the encephalitic process (substantiated by autopsy) was made possible by the study of the singular behavior of the epilepsia continua and by considering those diseases in which a continuous epilepsy of a strictly Jacksonian type sets in with relatively the greatest frequency, namely, atypical progressive paralysis with local lesions; certain forms of syphilitic meningo-encephalitis with condensed miliary encephalitic areas and hemorrhagic encephalitis. The first two diseases, the diagnosis of which was already excluded above, are distinguished by the fact that the acute edema is immediately followed by very vehement proliferation of new glia fibers and by an almost total atrophy of the second and third cortical layers of the pyramidal cells. Microscopically, in hemorrhagic encephalitis Poetzl found that the cortical focus of irritation, producing the epilepsia continua, corresponds to the points of most distinct retrogressive changes of the small pyramidal cells and proliferation of glia fibers and not to the parts where hemorrhage is most pronounced. Thus, very frequently, the substratum of an epilepsia continua is an acute inflammation of the motor cortical region, passing rapidly into a state of gliosis, a condition which may be termed acute diffuse or disseminated sclerosis of the motor region. (It is of some significance that at this point the smaller pyramidal cells are injured in abundance while the large pyramidal cells, especially Betz's giant cells, show but little pathological changes. This circumstance seems to favor the idea, that in epileptogenic changes the cells giving origin to the short cerebral tracts, connecting the convolutions closest to each other, are involved primarily and to a greater extent than the cells of the emissive projection tracts. In other words, the cross conduction of the motor sphere becomes affected while the longitudinal conduction may at the beginning be still intact.)

The experience of some observers, that in cases of partial epilepsy the cerebral swelling spreads along neuro-complexes and that such swollen territories are at times subject to marked subsequent shrinkage, as well as the fact that after frequent epileptic attacks the pressure of the cerebrospinal fluid and the crioscopic values of it fluctuate (Redlich and Pötzl), strengthen the theory that during the epileptogenic process the swelling of the colloids of the cerebral cortex is subjected to most marked fluctuation. It is probable that the stage of swelling, when the cells take up more than the normal amount of water, is followed by a stage of shrinkage during which the cells, probably the whole organ, expel water more than the normal amount. Such processes seem to play an important rôle during the development of acute glioses. It is just in the central nervous system that pure osmotic conditions play an important part. The rhythmic contractions of the torpedo fish placed in fresh water are ascribed by Kreidl to be due to osmotic conditions. These rhythmic contractions simulate strongly the contractions of epilepsia continua. The study of these observations prompted the diagnosis of local encephalitis in the lower part of the motor region passing speedily into a state of sclerosis.

In considering the mechanism of epilepsia continua, a suggestion may be offered in a general way that this disease corresponds possibly to a disturbance of a definite stage of innervation and conduction of impulses due to a lesion within a narrowly bound intra-cortical territory. This places the movements of epilepsia continua in opposition to those of chorea and athetosis. According to Bonhoeffer, etc., the mechanism of chorea, however, is located in the interbrain, especially in the nucleus ruber and is due to a disturbance of cerebello-fugal regulating influences. In epilepsia continua the disease is in the cortex and the cerebello-cerebral conduction is only secondarily involved. (See Pötzl and Schüller.) The sedative action of scopolamin in chorea indicates merely that the cortex is playing some rôle in the incoherent movements of the latter disease but not that the lesion itself is there located.

In our case the distinct hypotonicity of the muscles during the intervals of contraction, a symptom common in chorea, may be attributed to such a secondary cerebello-cerebral involvement.

At the suggestion of Wagner von Jauregg the behavior of epilepsia continua was closely watched in patients while asleep, and, like in the general epileptic seizures, the movements occurred during the period of slumber. In neurasthenia, alcoholism, etc., in normal individuals after exertion and in the prolonged hypnagogic stage, occasional clonic contractions of single muscles present themselves at time of falling asleep which, though physiologically not explained, seem to bear some relation to the latter phenomena. In this connection, the statement may be made that experimentally on falling asleep and on awaking the volume of the brain increases while during sleep it decreases. It is possible that this increase in volume in a brain disposed to swelling (recent theories associate epilepsy with cerebral swelling) is the starting point of cerebral edema before the onset of epileptic seizures. Finally it may be mentioned that, similar to the auto-stimulation of the retina in the hypnagogic stage, there may be a certain auto-stimulation of the cortex during such stage. Physiologically, nothing definite can be ascertained, but the fact remains that certain irritations of the emissive centers are not interrupted in sleep (as in epilepsy), while those located between the cortical and extra cortical centers (chorea and athetosis) are discontinued.

In studying the mechanism of the contractions of our case it was interesting to notice that their course resembled an experimental electrical irritation of the recognized motor cerebral centers. This analogy is especially applicable to the succession of the contractions. The first contractions affected the extensors of the right hand alone. They were elicited from the point where the encephalitic disease began. The microscopic specimens taken from between the middle and lower third of the anterior central convolution show signs of the most advanced stage of gliosis. Then followed unilateral contractions of the right facial, peculiar clonism of the tongue and motor aphasia, indicating affection of the operculum Rolandi. On May 18, after the general seizure, appeared bilateral contraction of the upper facial. This bilateral type of contraction is the rule in Jacksonian attacks, which is readily explained, if we remember that the character of contractions of the upper facial varies in different individuals. It is well known, that certain individuals can voluntarily close one eye and leave the other open (as in shooting, microscopy, etc.). This is a function acquired by practice and varies in individuals. The head and eyes were last to develop the clonic contractions to the right. At first they convulsed separately but in the later stage of the disease they merged and contracted simultaneously. This coexistent deviation of the head and eyes was important in localizing the disease, because it resembled the normal head and eye movements, the center of which was experimentally demonstrated to be located in the motor cerebral cortex at the foot of the second frontal convolution. At this point the centers for the head and eye muscles lie side by side and electrical irritation of it produces turning of the head and eyes sideways. This frontal type of head and eye-movements is voluntary in character and is usually used whenever we wish to see something. Only by special training and attention can this type of conjugate eye-movements occur without turning of the head. In our case, the above cortical area presented changes of fresh encephalitis with barely any increase of glia tissue thus determining the location and course of the lesion. The parieto-occipital type of conjugate eye-movements is usually not accompanied by turning of the head. It is a reflex, involuntary, synergical movement of both eyes and is used to fix objects seen, not yet grasped. In this case the motor component of the optic reflex responds by a rapid turn of the eyes to fix the object which stimulated the retina. In epileptic convulsions these two principal conjugate eye-movements are reproduced. The gyrus angularis type is associated with contralateral hemianopsia. In this type the deviation of the head if at all present occurs late, and during the interval of irritation the eyes deviate to the side of the lesions. These three characteristics are less evident in the frontal type of associated eye-movements. It would be folly to think with von Monakow, that just the eye-movements are stimulated from all possible sense spheres on special projection fibers, especially since such projection fibers have not as yet been proven. The emissive projection for the associated eye-movements from the frontal and parieto-occipital centers are rendered intelligible by the generally accepted division of cerebral architecture. The fibers of the frontal region course with the chief mass of motor fibers in the internal capsule. Jan Piltz and others have traced this upper neurone of the eye-muscles to the neighborhood of the corpora quadrigemina. The parieto-occipital projections are very likely the fibers of that part of the strata sagitalia (belonging to the parieto-occipital medullary substance) which pass at the side of the corpus geniculatum laterale in the neighborhood of the pulvinar thalamæ and radiate into the anterior corpora quadrigemina.

Thus the purely clinical experience concerning the clonic contractions of the eye muscle favors the conception, that the two chief cerebral knots of associative eye-movements, experimentally demonstrated on animals, are in their essentials also found in man.

These two hypothetical cerebral tracts meet in the mid-brain another path for conjugate eye-movements, the fibers of which originate in the cerebellum and represents the emissive leg of the static reflexes. The latter associated eye-movements occur unconsciously upon fixation when the position of the head is changed and are due to labyrinthine irritation. Their centripetal tract is the nervus vestibularis and the connection of its nucleus with the cerebellum. The emissive part of this reflex extends from the cerebellum to Deiter's nucleus therefrom through the posterior longitudinal bundle, to the nuclei of the nerves supplying the eye muscles, and finally, to the anterior corpora quadrigemina (in the neighborhood of the lamina quadrigemina) in which, to a certain extent, all the projection tracts of the associative eye-movements unite. At this point the nucleus of the posterior longitudinal bundle has been marked as the hypothetical center of the labyrinthine conjugate eye-movements. The terminus of their cerebral tracts has not as yet been ascertained. It is however certain that they cannot be traced to the nuclei of the eye muscles. It is therefore probable that at the point where the three so-called projection fiber systems are focused "the center of associative eye-movements" is located. This center transmits the impulses of the combined associative eye-movements upon the nuclei of the nerves supplying the eye muscles.

The case under consideration offers no occasion to enter more minutely into the hypothesis of the eye-movements. It might, however, be mentioned, that on electrical irritation of the anterior corpora quadrigemina in animals combined movements, having the character of the associative eye-movements, can be regularly elicited; also, that lesions in the region of the corpora quadrigemina destroy the synergical action of the eye muscles.

To study the cerebral mechanism of the associative eye-movements in man no disease is more suitable than partial epilepsy, and this case, being most applicable from this standpoint, had to be considered somewhat more minutely.

In conclusion the clinical and the pathologic-anatomical significance of the case will be briefly resumed. Considering the general nature of the disease the terminology, "acute encephalitis," is not satisfactory. Its etiology is not known. Clinically the patient did not present one tangible objective sign to speak in favor of an infectious or toxic process. Unfortunately the disease could not be transmitted to an animal. This Flexner and Landsteiner proceeding would have rendered the case more comprehensive and valuable, because in connection with the progress concerning the infectious nature of the Heine-Medin disease (through the studies of Landsteiner and Levaditi, Leiner and Wiesner, Flexner and Lewis, and others), there is now a growing tendency to identify etiologically acute encephalitis with acute poliomyelitis. So long as these questions are not solved experimentally the clinician is obliged to depend upon a history of infection in each case. In our patient no history to that effect could be obtained.

Similar to acute multiple sclerosis, or acute disseminated encephalitis, the pathological changes show here a vehement onset and the formation of separate circumscribed plaques. But in addition the specimens present changes of diffuse gliosis involving a large cortical area irregular in outline. On the contrary, the acute changes of the lesion differ. The predominance of vascular and round cell infiltration which characterize acute disseminated encephalitis is entirely absent in our microscopic preparations. Instead, we find here vascular changes characterizing encephalitis hemorrhagica. The most interesting feature of this case is the unusually rapid progress of the glia tissue proliferation. This is not present in hemorrhagic encephalitis, and has not as yet been described. Considering the peculiarity of the encephalitic disease, and viewing the case from a purely pathologic-anatomical standpoint, it is just to apply to this disease the new term, ***partial, acute, diffuse sclerosis of the brain.*** This conception is analogous to the familiar conception of acute multiple sclerosis of the brain and spinal cord.

At this point the statement must be made that the pathological changes were not entirely local but that there were signs of a general cerebral affection. Along with the described acute pathological changes of encephalitis hemorrhagica a large portion of the brain was in a state of hyperemia and edema, corresponding to mild forms of toxic hyperemia, and in some parts of the cortex few miliary hemorrhages were scattered. On the other hand we must not lose sight of the bilateral symmetrical disease in the region of the cornu ammonis, uncus and regio innominata at the base of the frontal lobe. The area affected is round about the fissura choreoidea. In circulatory disturbances of the brain, the involvement of this region is explained on a purely physical basis, and in many cases of epilepsy, this territory presents a typical sclerosis. Pötzl and Schüller called attention to the fact that in cases of encephalitis hemorrhagica and in diffuse luetic encephalitis the cornu ammonis shows very marked changes. They also pointed out the analogy of such findings with cornu ammonis sclerosis of epileptics, as well as the relation of the cornu ammonis sclerosis in tumors of the temporal region to the frequency of epileptic attacks.

This bilateral symmetrical acute sclerosis of the cornu ammonis in our case is very likely a further index to a general brain disease. The distribution of the disease over the whole organ obeys the purely mechanical rules of cerebral circulation, and, due to individual factors not nearer ascertainable in this case, leads to a special involvement of a circumscribed vascular area and development of the local symptoms. Viewing the case from this standpoint, the most striking feature about the lesion is not the local accentuated pathological change but the general affection of the brain. In other words, we have before us a case of general hemorrhagic encephalitis and due to individual factors not nearer ascertainable, within marked degree a circumscribed vascular area in the motor region, leading rapidly to a partial diffuse sclerosis of a deformed part of the brain.

The acute sclerosis of the cornu ammonis brings this case nearer to the pathological changes of the so-called idiopathic epilepsy. Its entire course represents in some respects an acute, precipitated development of an epileptic cerebral change. According to the views of Von Wagner and Redlich, there is no sharp line of demarcation between so-called genuine epilepsy and Jacksonian epilepsy. In many cases of the so-called genuine epilepsy a local disease is clearly evident from the behavior of the seizures and from the unilateral attacks. We know what significance infantile cerebral diseases have in the development of epilepsy at a later period of life. It is therefore probable that the case here described represents the acute developing stage of one of those infantile cerebral diseases, which, if it heals, gives the basis for the development of an idiopathic epilepsy at a later period of life. This development does not occur, according to clinical experience, until some special constitutional cause not alone of cerebral origin sets in. Whether and how far these causes are specific cannot at present be determined.

Again, considering the numerous cases of microgyra in epileptic idiots which are frequently described in pathological anatomy as diffuse sclerosis, it is probable that a part of such diseases proceeds from acute encephalitic diseases similar to the one here described but not terminating fatally. Very likely the bulk of such diseases sets in at early childhood and during their acute eruption pass under the name of "cramps" and usually escape closer clinical and anatomical investigation.

CONCLUSIONS

1. Although the history of the case reveals no etiologic factor for the disease the pathological anatomy bears the finger-marks of a toxic agent.

2. The acute cerebral changes are characteristic of encephalitis hemorrhagica.

3. The vehement gliomatous proliferation of the left motor cortical region renders the lesion singular in character.

4. It is probable that this vehement sclerotic process in the

motor cortical region is an essential factor in the production of the convulsions.

5. The character of the clonisms, their gradual extension to the adjacent cortical centers and the slowness of their tendency toward generalization made the character of the pathological process comprehensive.

6. The presence of the frontal type of the head and conjugate eye-movements assisted considerably in the localization of the lesion and the direction of its route.

At this point it gives me great pleasure to thank Hofrat, Professor Doctor Julius Wagner v. Jauregg for the kind hospitality at his clinic and laboratory and for his permission to publish this case. I also wish to express my gratitude to Docent Doctor Otto Pötzl for his friendship and consultations in this case.

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Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

JOINT MEETING HELD WITH THE SECTION ON NEUROLOGY AND PSYCHIATRY OF THE N. Y. ACADEMY OF MEDICINE

November 12, 1912

The President, Dr. L. Pierce Clark, and the Chairman of the Section on Neurology and Psychiatry, Dr. E. W. Scripture, presiding

A CASE OF "PERIODICITY IN THE MALE"

By C. P. Oberndorf, M.D.

The patient, a machinist by trade, was born in Illinois in 1883. His family history, with the exception of epilepsy in one brother, was negative, and no similar abnormality existed, so far as he knew, in any other member of the family. His general health was good; he was not addicted to the excessive use of alcoholic stimulants, and denied venereal infection.

His physical development progressed normally up to the age of thirteen, when he noticed that his left breast gradually began to increase in size until it attained its present development, about the size of that of a young girl. The musculature of his body was firm and distinct, the external genitals were fully developed, the body was hairy and the pubic hair was of the male type. The skeleton was on the whole of the masculine type, although the waist was rather narrow, the hips a trifle large and there was quite a tendency to lumbar lordosis. The patient's face presented an unusually youthful appearance, so that he might readily be taken for a boy of twenty instead of a man of twenty-eight. The hair of the face was so sparse that he found it necessary to shave only once or twice a week. At seventeen his voice "changed," but it still remained decidedly soft and rather high pitched.

The patient indulged in masturbation about three times a week from the age of fifteen to eighteen, when he began normal sexual intercourse. He then began to notice that his sexual desires were active only once a month, usually about the 22d of the month, when they became extremely strong. At the same time of the month he noticed that the left breast would become not only stiff and erect, but also extremely sensitive and tender, a condition which usually persisted for about four days. For the past year or two he had noticed an oily secretion appearing about the nipple at the time that the breast became sensitive. Seven years ago he observed that by rubbing the left breast he could obtain an erection of the penis: the same reaction was subsequently noticed when a physician who was administering electricity happened to place one electrode over the left breast.

The mental symptoms accompanying these periods were marked. The patient became restless, anxious and depressed; he was easily frightened and irritable, and there were annoying attacks of vertigo and flushes of blood to the head. For the past two years he had avoided sexual intercourse because of a waning desire, but during his periods he had involuntary emissions. Because of the remarks and annoyance to which he had been subjected at the hands of his acquaintances on account of his abnormal breast, he had gradually withdrawn from society and had become more and more seclusive. While he was formerly fond of athletics, he had abandoned them on account of the necessity of disrobing before men, and he was inclined to give up his work as machinist because when he appeared in his shirt the deformity was sooner or later noticed by his fellow-workmen. He had been treated with orchitic substance with rather meager success, and continued very much worried over his condition.

Dr. Oberndorf, in addition to the above, reported a second case of "periodicity in the male" that had recently come under his observation.

Dr. B. Onuf said the case shown by Dr. Oberndorf reminded him of some of the literature on the subject of the condition of the breasts in cryptorchids. Well-developed breasts had been found in eunuchs and observations had been reported by Hammond on Aztecs where for religious purposes male subjects were masturbated excessively and compelled to ride horse-back with the desired result of producing frequent emissions until finally atrophy of the testes occurred. In some of these subjects the breasts became quite large and even secreted milk and the whole aspect changed, assuming the characteristics of eunuchs, the beard and mustache falling out, the face becoming feminine in expression, etc. It had also been observed, *vice versa*, that in some cases where swelling of the breasts developed after injuries there was subsequent atrophy of the testes. The case shown by Dr. Oberndorf was particularly interesting on account of the enlargement being limited to one breast, and the query naturally arose whether true hermaphrodism had been excluded. In insects Forel found cases of hermaphrodism where one half the body had the characteristics of the male, and the other half those of the female, and even cases where certain parts of the body showed the characteristics of the two sexes. This was particularly striking in those cases where the female insect differed greatly from the male one in size, shape, color, etc.

Dr. Smith Ely Jelliffe said that the general subject presented by Dr. Oberndorf was of more than usual interest. The latter case, particularly in its bearings upon the general subject of bisexualism, the periodic psychosis coinciding with what would be a menstrual excitement in this man with an enlarged mammary gland, was an important contribution to this much vexed subject. The mythical antithesis, namely the Amazon, was too well known to need any further discussion.

A CASE OF DYSTONIA MUSCULORUM DEFORMANS (OPPENHEIM)

By I. Abrahamson, M.D.

Dr. Abrahamson presented a girl of thirteen years, of Jewish extraction, whose present illness began five years ago with tonic spasms affecting her right hand and interfering with her writing. Her family history was negative and her previous history unimportant.

The condition of the right hand became progressively worse, and a year later the left hand became similarly involved. For the past two years the disturbances of gait and station have been of increasing severity. Dr. Abrahamson said that this patient's age, the slow course of the disease, the presence of symptoms in the lower extremities only when erect or when walking, the scoliosis with slight lordosis, the easily induced fatigue, the tonic spasms of the hands, at first only on writing, etc., and now accompanying all attempts at volitional movements, the athetoid-like spasms, the peculiar, coarse tremor, the absence of hypertonus, the loss of tendon reflexes in the upper and their inconstant character in the lower extremities, the absence of organic symptoms referable to the brain or cord, the peculiar gait, the absence of grimacing and facial over-action, all indicated the presence of either the new Oppenheim's disease or a double athetosis.

Dr. J. Ramsay Hunt said that at a previous meeting of this Society he had presented, as possible dystonia, a case which in many respects was similar to the one under discussion, although he had been unwilling, in that case, to make a positive diagnosis of dystonia. There was involvement of the arm and leg on one side, and to a lesser extent of the opposite leg, while the trunk muscles were entirely free. There was no athetosis, nor anything resembling it and the nature of the motor disturbance corresponded very closely to Oppenheim's description, although the trunk was free.

Dr. William M. Leszynsky called attention to the fact that when this patient was at rest there was no rigidity whatsoever, which corresponded with the case of dystonia musculorum which he had presented at a meeting of the Society some years ago.

Dr. Edward A. Sharp read a paper with the title: "The Aborted Forms and Preparalytic Stage of Acute Poliomyelitis as observed in the Buffalo Epidemic" (*To be published in this Journal*).

Dr. Nelson G. Russell, of Buffalo, who had done the pathological work in the cases reported by Dr. Sharp, said he would confine his remarks to the blood and spinal fluid findings. In some cases the cerebrospinal fluid seemed to give definite information early in the course of the disease. Quite a number of cases were seen which gave an average count of 37 cells to the c.mm. The highest polynuclear count was 10 per cent., which was found in an acute case in the pre-paralytic stage. The average count in the pre-paralytic cases was 78 cells. In the aborted cases the count was considerably lower, averaging 27 cells, which was lower than the average count throughout, and considerably lower than in the pre-paralytic cases. In four instances a tuberculous meningitis was present, and in two of these the organism was found. This, the speaker said, seemed to him to weaken the specific value of the finding of the organism in the spinal fluid, although its value as a laboratory test could not be disputed.

The Fehling solution test was tried in all of the cases. In the meningeal cases it was faint in two, absent in two, and it was also absent in one of the pre-paralytic cases. In all the others it was present. Its absence in the cases mentioned might have been due to delay in making the test. In one case, supposed to be an aborted one, the patient was a boy who had meningeal symptoms, stupor, pain in the back of the neck, etc. His cerebrospinal fluid gave a count of 23 cells and there was a slight increase in the globulin reaction; no paralysis. Three days later he gave a positive Widal, and ran an ordinary course of typhoid fever.

The blood findings in their series of cases, Dr. Russell said, were the usual ones that had been reported, excepting that they did not get the increase in the lymphocytosis that had been found by some. In their cases the white cells ranged between 8,000 and 30,000, with a relative increase in the polymorphonuclears.

Dr. Russell said it seemed to him that at present we had no accurate means of making a diagnosis of poliomyelitis in the early or pre-paralytic stage, unless the serum reaction might be of some value.

Dr. Marcus Neustaedter said that since the elaboration of his theory that the infection of poliomyelitis was transmitted by dust he had been on the lookout for clinical evidence to bear out that theory. During the past two years he had investigated about 58 cases, some before the onset of the paralysis, and he had invariably found that at the onset of the attack there was a history of sneezing or attempts at sneezing, and that instead of a red hyperemic condition of the throat and pharynx, which was the usual accompaniment of infectious diseases, we had in poliomyelitis an anemic and edematous condition of the throat and pharyngeal mucosa, a glistening condition with a serous, frothy transudate. This symptom even remains a week or two after the paralysis appeared.

Dr. M. Allen Starr said the remarks of Dr. Neustaedter in regard to the appearance of the throat in early poliomyelitis led him to refer to the work done recently by Drs. Draper and Peabody on the pathology of this disease, which went to show that poliomyelitis, like every infectious disease, was attended by changes in almost every organ of the body, including the spleen, liver and kidneys, and the mucosa generally, and it was reasonable to infer that there was some congestion of the throat, but the speaker said he would scarcely regard that as a diagnostic point of value, because in every infectious disease there was more or less implication of the mucosæ.

Dr. Neustaedter said that Dr. Starr had apparently misunderstood him. What he said was that in poliomyelitis, instead of a red, hyperemic condition of the throat, similar to that observed in other infectious diseases, we had here just the reverse, a white, glistening, edematous mucosa which was quite distinctive.

Dr. Harvey Cushing, of Baltimore, was requested to speak of the experiments of Dr. M. J. Rosenau with the horse-fly as a possible disseminator of this disease. He said that many had worked on the etiology of poliomyelitis, and various theories regarding the route of entry of the infection had been advanced. The fact that cases cropped out so often in supposedly healthy communities and comparatively infrequently in crowded communities had led many to believe that an insect was the possible infecting agent. With that idea in mind, Dr. Rosenau was the first to investigate the common barn-fly as the possible source of infection. After going through a long series of preliminary work and experiments he was finally able to demonstrate that monkeys bitten by infected flies of this variety have in some instances contracted poliomyelitis. He did not wish to claim too much for this theory, but simply made the suggestion that if we could get rid of the barn-fly as well as the ordinary house fly, we would advance another step in the line of preventive medicine.

Dr. I. Strauss said the report of Dr. Rosenau's experiments with the barn-fly had interested him very much, because during the 1907 epidemic of poliomyelitis he had taken blood from a patient during the stage of high fever and inoculated a monkey without loss of time, with no result. Subsequently, Dr. Flexner, using about 20 c.c. of blood, was able to transmit the infection from one monkey to another.

Dr. Strauss thought no one would deny that the infection of poliomyelitis probably entered into the circulation, although it seemed to have a predilection for the lymphatic system, and the most important lesson to be learned from the experiments of Dr. Rosenau was that the virus of the disease was viable in the fly. We still had a long distance to go to prove that in nature the virus was transmitted by the barn-fly, although it was true that some of the epidemics of poliomyelitis occurred in country districts instead of in the city; a notable example of this was the epidemic in Sweden.

Dr. Smith Ely Jelliffe said that he was very much interested in Dr. Sharp's paper, because it emphasized what always had seemed to him to be in great need of emphasis, namely the necessity for dealing with the abortive cases. His experience had led him to feel that these abortive cases were very common; whether they were as common as Wickman claimed, namely four to one of the ordinary cases, he could not express an opinion, but many abortive cases pass unrecognized, and are sources of contagion.

The special type of incidence he felt was worth referring to. These patients suffer from a sudden malaise, with some nausea and diarrhea, and slight pain, which passes off in a day or two. These little patients are then allowed to get up, run around, and then a day or two later are suddenly stricken down and develop typical poliomyelitis. In other words, a case which in all probability would have been an abortive one becomes a well-developed one by lack of foresight.

Apropos of Dr. Strauss's remarks concerning the horse fly, Dr. Jelliffe called attention to the fact that the fly followed in the wake of the horse, and therefore was not confined to barns, but was distributed throughout the whole country.

The President, Dr. Clark, said he was impressed, from the papers and discussions on poliomyelitis at the Washington Congress this fall, that there were many atypical and suspicious cases of poliomyelitis that went unrecognized, and that no real or adequate study of the transmission of the disease could be made until all of the anomalous types of the infection and the possibility of even the well being carriers of the disease had been made. As yet all of the different theories and suggestions of the method of disease transmission leave much to be desired before clinical acceptance of their utility can be vouchsafed.

EXPERIENCES WITH THE MENINGEAL FIBRO-ENDOTHELIOMATA

By Harvey Cushing, M.D.

The speaker made some remarks on this subject. He reported in detail a number of cases of meningeal fibro-endotheliomata that had come under his observation, and showed several specimens illustrating the massive size sometimes attained by this form of intracranial growth.

Dr. M. Allen Starr said the specimen shown by Dr. Cushing was the largest tumor of the brain he had ever seen. He could agree wholly with Dr. Cushing in the statement made regarding the attachment of this type of tumor to some portion of the dura, and it was not always an easy matter to recognize the site of such attachment. He recalled a case which was operated on by the late Dr. Andrew J. McCosh where the growth was located in the occipital lobe and the diagnosis was comparatively easy, but upon opening the dura no evidence of a tumor could at first be seen. In running his finger down along the falx, Dr. McCosh finally discovered the growth, which had its origin at least three inches below the upper portion of the falx, to which it was attached.

Dr. Cushing had spoken of the long duration of these cases of meningeal fibro-endotheliomata. Dr. Starr said that while it was generally held that the average duration of a brain tumor, if left undisturbed, was about three years, he believed that if these patients were carefully observed and their past history examined, we would find that the earlier symptoms dated back longer and were usually not recognized. In a case of tumor of the pontine angle which he had recently had operated upon by Dr. Frank Hartley, the patient first came under his observation last July; he then had no symptoms of any brain tumor, but complained of headaches which extended back for a year and a half. He went to Europe, and upon his return the symptoms of tumor were so evident that an operation was done, and the findings showed that the tumor had probably existed long before it gave rise to recognizable symptoms. In one of the cases referred to by Dr. Cushing the symptoms probably extended back seven years before any diagnosis was made, certainly four years.

In regard to changes in the skull accompanying the growth of these tumors, Dr. Starr said this had been frequently noted by him. He recalled one case, seen in the service of Dr. George L. Peabody at the New York Hospital, where the parietal bone was reduced to the thinness of a sheet of paper and at the autopsy the bone could be indented without any difficulty. Dr. Cushing made no mention, however, of an occasional enormous thickening of the skull over certain tumors of the brain, which the speaker said he had observed in several instances, where on laying back the flap it was noticed that the thickness of the bone was much increased in the area overlapping the tumor.

Dr. Starr said he was glad to hear Dr. Cushing advise decompression on the side opposite to that occupied by the tumor. This appeared to him to be a very excellent idea. Personally, he did not know of any case where it had been done in New York. Referring to the size sometimes attained by brain tumors, Dr. Starr recalled one case where the patient had been under his observation for a year and a half: he was also seen by other neurologists, and from the symptoms it was apparently impossible to locate a tumor. At the autopsy, the entire right lobe as far back as the central fissure was found completely disorganized, the area being occupied by an infiltrating glioma, and yet that patient's symptoms, with the exception of a persistent headache, were very few. There was no choked disk, no increased intra-cranial pressure, and no accumulation of fluid in the ventricle. Hydrocephalus was present in these cases only when there was pressure on some part of the ventricle, which prevented the free interchange of fluid.

With regard to the recurrence of these tumors, the speaker said he had in mind one case where Dr. Hartley had operated three times and there were several cases upon which he had operated twice. The longest interval between these operations was two years: in several, the second operation was done within a year and a half, and Dr. Starr said that from his experience he was inclined to believe that the recurrent growth was usually more rapid in its progress than the primary one.

Dr. B. Sachs said the newest thing Dr. Cushing had given us was the contra-lateral decompression operation, with which idea the speaker said he was impressed very favorably. He was rather astonished to learn, however, that Dr. Cushing would expect a loss of function from mere herniation; he had had no idea that anything of that sort would occur and he had never met with it in his experience with a considerable number of decompressions over the left hemisphere.

Speaking of the duration of brain tumors, Dr. Sachs said he could recall a number of cases where epileptic convulsions occurred at very long intervals and where the presence of a neoplasm was not suspected in spite of frequent examinations. He particularly had in mind one case, a young man who was under his observation for a number of years, during which period he had epileptic convulsions at long intervals and no other symptom. When he finally died, a huge tumor mass was found occupying the greater part of one hemisphere. Personally, the speaker said, he did not feel very hopeful of recovery after the removal of these large growths in the brain. The importance of doing these operations in two stages was becoming more apparent. The removal of these large tumors from the brain was a very serious surgical procedure, and the results after a two-stage operation should be distinctly more favorable.

Dr. Foster Kennedy said he could recall three cases where patients without organic neurological signs complained of intense headache which proved to be due, apparently, to an exostosis. Two of these were operated on and both almost died from shock, apparently due to the removal of the enormously thickened bone. Underneath this was found a small, soft growth, one of which, under the microscope, presented the whorled arrangement of cells typical of endotheliomata.

Dr. J. Ramsay Hunt said he could recall no case of endothelioma of the dura that was removed by operation, although he had seen many such growths accidentally found at autopsy. They were usually very small, about the size of an almond or filbert, and were purely accidental findings. He also recalled the case of a negro, a tunnel laborer, who was brought to the New York Hospital suffering from convulsions. He died a few hours after admission, and the autopsy showed an enormous endothelioma of the dura occupying the frontal lobe. It was not as large, however, as the one shown by Dr. Cushing.

Referring to endotheliomata of the cerebello-pontine angle, Dr. Hunt said that at one time he had studied a series of these cases. It was then thought that they were neuro-fibromata, having their origin in the acoustic or perhaps the facial nerve, and in quite a number of these growths he was able to demonstrate medullated nerve fibers extending well into the cortical substance of the tumors. In two of the cases, neuro-fibromata were present elsewhere in the body, so that while endothelioma may occur in this region, we must also recognize the occurrence of neuro-fibromata as well.

Dr. Hunt said he had recently been particularly interested in a group of cord tumors, of which he had seen six and which were successfully removed by operation. These, it could be shown, had no connection with the dura, but were intimately attached to the pia mater. Histologically, they were endotheliomata; others called them fibro-sarcomata, and they certainly formed an interesting histological group.

Dr. I. Abrahamson, accentuating the fact brought out by Dr. Starr, said he had seen two cases of tumor of the brain in which the overlying bone was very much thickened; so much so that the patients were almost exsanguinated when the skull was opened.

The speaker said he had one case where Dr. Charles A. Elsberg had done a preliminary contra-lateral decompression operation. In this instance the intra-cranial pressure was so pronounced that it was necessary to aspirate the ventricle.

Dr. Clark said that in an extensive series of autopsies on asylum cases he remembered two cases of multiple endothelioma with very extensive skull erosions in which not only was there no pain in clinical manifestation, but the cases ran a rather typical course, with a feeling of well being characteristic of paresis. In fact, the latter diagnosis was only disproven at the autopsy.

PROCEEDINGS OF THE FOURTH ANNUAL MEETING OF THE INSTITUTE OF CRIMINAL LAW AND CRIMINOLOGY

The fourth annual meeting of the American Institute of Criminal Law and Criminology was held in Milwaukee, Wisconsin, August 29-31, 1912. The address of welcome was delivered by Governor F. E. McGovern, of Wisconsin. He emphasized the need for investigation into the methods of managing prisons. Every penitentiary should aim at putting convicts upon their feet, so that when they leave the prison walls they may be able to take care of themselves in normal society. Every penal institution, furthermore, should be self-supporting. It is an indication of bad management, in the opinion of the governor, when the state must appropriate, as Wisconsin has found it necessary to do, $50,000 a year for the support of a penitentiary.

The President's address was given by Chief Justice John B. Winslow of the Supreme Court of Wisconsin. He laid especial emphasis upon the need of public general education, through which ultimately our social problems may be solved. At the conclusion of his address he made several recommendations. Those that are of particular interest to the readers of medical journals relate:

First, to the necessity of making a distinction between the confirmed criminals and those of whose reform there is hope. Means should be given to the trial court to estimate in which class the convicted person belongs.

Secondly, to the necessity of segregating permanently from society those for whose reform there is no hope.

Thirdly, first offenders and persons of whose reform there is substantial hope should enjoy suspension of sentence, or should be committed to reformatories especially designed for such offenders.

Fourthly, juvenile courts should be provided for child offenders, and these courts should be endowed with broad powers so that they may treat the child sympathetically.

Fifthly, segregation or other efficient means should prevent the imbecile and the degenerate criminal from returning to normal society.

In his annual address the Hon. Frank L. Randall, superintendent of the State Reformatory, St. Cloud, Minnesota, took advanced ground. He said in part as follows:

The judges and lawyers are experts in determining an accomplished fact. No other persons are equally skilful in that regard. The work, therefore, of determining whether or not an unlawful act, involving serious moral turpitude, has been committed, and, if so, by whom, must necessarily be left to the courts, and the court's officers, as it always has been. When the commission of the wrong, and the identity of the wrong-doer have been established, nothing should remain for the court to do, but to commit the defendant to the custody of a commission, charged with full responsibility for his care and custody, until his final release from the jurisdiction of the state. One exception should be here noted, based on the fact that imprisonment is an artificial and abnormal condition, and that, per se, it is not good. It should be resorted to, and is justified, only when necessary, and when it is preferred to the continued liberty of the delinquent. Therefore, when an application is made for probationary liberty, before commitment, the court should hear and cautiously determine the matter, but, when a determination has been reached adverse to the applicant, the work of the judiciary should be closed, with the passing of the defendant into the custody of the commission. Under this system the defense of insanity would not be heard in court, nor the question of mental responsibility. Such matters would be quite immaterial at the trial, and would be considered at a later date by public servants, charged with a peculiar and continuing duty and responsibility in that connection, and equipped with all facilities for deliberately determining the subject's condition. The fact that the crime had been committed by him, and that it was necessary to the interests of the public that he be restrained of his liberty, to the end that he could not repeat his wrongs, would be as far as the court would go with him.

Whether a man is dangerous because he is insane, or intoxicated, or whether, being sane and sober, he is dangerous because he is vicious, makes him an equally undesirable man to be at liberty, and equally calls for his restraint; the only difference being in the place to which he should be committed, and the treatment that should be given him. The penal institutions should be for the care and treatment of acute cases only, while a custodial asylum should be for the chronic offenders, who have demonstrated their incapacity or viciousness, or their corrupting influence, and for those in whose future no prospect of good citizenship can be discerned. That there are many such persons every warden knows.

Commitment to the custodial asylum would not be tantamount to life imprisonment, but it would continue until such time as a change might come, when a transfer might be ordered, or liberty within severe or easy limitations, or even an absolute release, might be determined to be best. This part of the work can be better performed by the commission than by the court, for the court must act promptly, and on limited data, and in the way of prophecy, while the commission would place the person under observation and examination, and dispose of him as seemed best, having full power to transfer him from one institution to another, as his changing condition, or the judgment of the commission, might indicate to be proper.

This plan, at its best, would do away with minimum and maximum terms of imprisonment or treatment, and would mean the application of good sense in dealing with the anti-social and non-social. Then no person would be kept in detention unless a good purpose would be served thereby, and no person, properly imprisoned, would be released except for reasons which would appeal to the minds of well-informed men; for it will be understood that the commission would be made up of the best available men, and that they should devote their entire time to their official duties.

To be properly equipped for service the state should provide a receiving station, to which would be taken all convicted felons, who were not placed on probation (and many misdemeanants also), in the care of officers appointed by the commission. Many persons thus received could be assigned without much doubt or delay to the prison, the reformatory, the school for feeble-minded, the industrial or training school, the state farm for inebriates, the colony for epileptics, the hospital for the acute insane, or to the state custodial asylum, an institution which every state should have, and which should, in time, have a larger population than both the prison and the reformatory. Recidivists in misdemeanors should be decreed to be felons, and should be saved, as far as possible, from the consequences which follow their weaknesses. No more would we then read, in the report of a county work-house, that more than three hundred persons had each served more than fifty terms therein, for no sane and competent person will serve repeated terms in a workhouse or jail, and repeated convictions should be accepted as very strong evidence of helplessness, and conclusive evidence that the person needs attention and aid. Borderline cases between badness and madness, or between weakness and viciousness, could be longer detained at the receiving station, for observation sufficient to prevent serious misfits at any of the other state institutions, but the more extended work of observation and inquiry should be continued in each case after the delinquent has been assigned to one of the special state institutions.

A normal person, who has been convicted of crime, and who refuses to establish his identity, after he has had time to learn that the authorities wish to serve as his friend, is invariably one whose record has not been clear, and will not bring him credit. Such a person is entitled to no special favor. With the removal of the maximum term, and the substitution of the so-called indefinite term, and with a firm stand against any parole to unknown persons, he would make the necessary disclosure, unless he feared a transfer to a jurisdiction where his status would be still more unpleasant. With the maximum term of five years, hardly one per cent. of reformatory inmates will now hold their secret, if proper means are taken to deservedly win their confidence. When identity has been established, and the life history, more or less truthful, has been entered in the record, a basis has been laid upon which to build the full story. Repeated interviews will, in some cases, be necessary, and much correspondence must ensue, and perhaps some visits must be made, but, in the end, the man will be known to the authorities, for while this work has been going on, the institution physician, psychologist, teacher, chaplain, and keeper, have been getting acquainted with him in their several capacities, and submitting helpful reports from time to time.

Another matter that should be of some interest to the members of the medical profession is the report of committee A of the Institute, the duty of which has been to recommend a workable system for collecting and preserving in criminal courts data concerning criminals. It was recommended that our criminal courts should have associated with them an expert who has been trained in medicine, at any rate, in as far as nervous and mental diseases are concerned, and who has, furthermore, a thorough knowledge of psychology. The duty of such an adjunct of the court should be to collect all data possible relating to the family hstory and the developmental history of the criminal. The expert should accumulate, also, anthropological, psychological, and medical data relating to every case which comes before him. The chairman of the committee, Judge Olsón, Chief Justice of the Municipal Court of Chicago, proposes at the very earliest opportunity to secure such an official for his own court.

STERILIZATION OF CRIMINALS AND DEFECTIVES

Report by a committee of the Wisconsin branch. The subjects assigned to this committee were as follows:

First. In what ways can propagation of habitual criminals, imbeciles and lunatics be prevented?

Second. Should sterilization of such persons in proper cases be authorized by law?

In modern times the accumulation of large amounts of material in the shape of clinical statistics published by hospitals and medical journals has established beyond question the fact that heredity plays an essential part in the etiology of certain neuropathic conditions. Social workers have, in recent years, likewise collected data showing the effect of heredity, so that the doctrine of hereditary transmission is now incontestably established.

It will be only after united collaboration of many investigators and study of vast data of family traits and family pedigrees that we will be able to find out the fixed laws which govern heredity.

In view of the fact that the laws of heredity applicable to the classes in question have not been ascertained, the committee presented a series of actual family pedigrees showing to a certain extent the effect of hereditary transmission. The charts presented had been prepared by Davenport, Rosser, Goddard, and others. They illustrated in the opinion of the committee:

1. The necessity of the compilation of the genealogies of the institutional charges, including physical weaknesses, diseases to which the different members were liable and causes of death. This can best be done by the state through trained field workers under the direction and control of the various charitable and penal organizations.

2. The establishing of a chair of eugenics in the various colleges and universities.

3. The creation and equipment of at least one laboratory for the study of mental diseases in each state; the same to be located preferably at the institution nearest to a college or university having a medical school.

The combined efforts of the genealogists and eugenists will eventually lead to the discovery of the laws of heredity applicable to the human race. This, however, will not suffice, for the reason that the principles of prepotency or offset are equally as important in ultimately working out the salvation of the race by better breeding. Given the laws of heredity and the principles of prepotency they can be taught in the home and public school to the child of tender years. With this knowledge from infancy the normal, mature person, contemplating marriage, will demand genealogies and will shun any alliance which can only result in suffering to itself and its offspring.

There are three methods by which the propagation of these defective classes can be influenced: by regulation of marriage, by effective sequestration, and by destroying the power of the individual to produce offspring.

Laws have been passed attempting to regulate marriage. There is no doubt but that conditions have been somewhat improved by such laws. It is wise to withdraw the approval of the state from the marital union of people unfitted to care for and train the children they might produce.

Sequestration, if perfect, would be absolutely effective. It is doubtful if it can be made complete, however, especially in men. Among the insane, parole, in some cases, appears not only justifiable but beneficial. Among the feeble-minded, absolute enforcement of sequestration would appear unwise. In such cases it would unnecessarily tend to separate some children from their families permanently; and, moreover, the higher grades of feeble-minded are instinctive tramps, and absolute sequestration would mean a closeness of confinement, totally at variance with the idea of making institutions, colonies, with almost the freedom of action of the country village, rather than places of confinement.

The jury trial is always available, and it is difficult to make a jury, drawn from average citizens, believe that the often pleasing appearing, high-grade imbeciles, and especially those where the moral qualities are chiefly at fault, give any cause for retention under the care of the state. With girls retention is easier than with boys, as their tendencies for elopement are not so marked.

It cannot be doubted that sequestration is in some measure effective. For the last few years we have noted a steady decrease in the number of applications to the Wisconsin Home for Feeble-Minded, due, we believe, to the great number of highest grade feeble-minded women who have been retained under the shelter of that institution.

In most of the few cases where our higher grade girls have been taken from state care, the results have been regretable, but conditions have been better than in some states where the control of the state is nominal. The superintendent of one institution asserts he is now receiving the children of the girls released.

The number of feeble-minded, including juvenile delinquents (the criminal feeble-minded), is enormous.

Dr. Goddard, of the department of research in the New Jersey institution, estimates the present number in the United States at 300,000. He points out, especially, the large proportion of feeble-minded in reform schools, placing them at not less than 25 per cent. These are the "criminals" who come under the scope of this paper, because their condition is permanent. They are usually sufficiently bright to mate with others of about the same mental status, and begin new lines of degeneracy. Unless they are under guardianship, they have not concentration of purpose to make a living for themselves and those dependent on them, nor judgment to prefer right doing to wrong doing, nor the will-power to resist the ordinary temptations of life, which come to all. On them, punishment has little effect and reasoning is wasted. They are "repeaters" in crime. They are generally the offspring of those who have weakened their moral control through constant self-indulgence. They would probably belong in the class we are considering as proper subjects for surgical interference. From them spring all forms of neurotic defects.

For the purpose now under consideration, feeble-mindedness is the most important subject, and with it may be properly classed epilepsy, as feeble-minded or epileptic parents almost invariably transmit their qualities to their children in varying degrees and such offspring on account of their incapacities, misdeeds or crimes frequently become public charges or come into conflict with the authorities of the law.

Certain types of insanity, also, notably Dementia Præcox and Manic Depressive insanity in the parents, show a marked tendency to reproduce themselves in the children also, as feeble-mindedness, criminality and other forms of degeneracy.

Neurotics reproduce neurotics with tendencies to neuroses, insanity, feeble-mindedness, drunkenness, pauperism, and criminality. Insanity is more often inherited from the insane. Feeble-minded is the offspring of all neuroses, since any check to the growth of the brain must affect the development of the mind. In short, except in rare instances, feeble-mindedness, insanity, criminality, inebriety, and pauperism may be looked upon as allied conditions with marked tendencies to be reproduced in one or another form in the children of persons affected with such infirmities, and with a strong tendency for the defects to become more marked with each succeeding generation and to be accentuated by unions between such defectives, as persons belonging to these various classes have a strong affinity for others of their kind.

Efforts have been made to find a family where two defectives have united and produced normal children. No record of such a family has been found.

That the insane are increasing much faster than the general population is undoubted. The census reports show this. The increase has aroused public interest to such an extent that several states have passed laws for the absolute prevention of increase, by operation. The decision in each state is left to a commission. The committee has summarized the law bearing upon the situation in each of the ten states that up to date have adopted legislation.

Translations

MYTH OF THE BIRTH OF THE HERO

[A Psychological Interpretation of Mythology]

By Otto Rank, M.D.,

of Vienna

Translated by Drs. F. Robbins and Smith Ely Jelliffe

The prominent civilized nations, such as the Babylonians, Egyptians, Hebrews, and Hindoos, the inhabitants of Iran and of Persia, the Greeks and the Romans as well as the Teutons and others, all began at an early stage to glorify their heroes, mythical princes and kings, founders of religions, dynasties, empires or cities, in brief their national heroes, in a number of poetic tales and legends. The history of the birth and of the early life of these personalities came to be especially invested with fantastic features, which in different nations even though widely separated by space and entirely independent of each other present a baffling similarity, or in part a literal correspondence. Many investigators have long been impressed with this fact, and one of the chief problems of mythical research still consists in the elucidation of the reason for the extensive analogies in the fundamental outlines of mythical tales, which are rendered still more enigmatical by the unanimity in certain details, and their reappearance in most of the mythical groupings.[1]

The mythological theories, aiming at the explanation of these remarkable phenomena, are, in a general way, as follows:

(1) The "Idea of the People," propounded by Adolf Bastian[2] [1868]. This theory assumes the existence of elementary

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[1] A short and fairly complete review of the general theories of mythology and its principal advocates is to be found in Wundt's "Völkerpsychologie," Vol. II, Myths and Religion. Part I [Leipzig, 1905], p. 527.

[2] "Das Beständige in den Menschenrassen und die Spielweise ihrer Veränderlichkeit." Berlin, 1868.

thoughts, so that the unaminity of the myths is a necessary sequence of the uniform disposition of the human mind, and the manner of its manifestation, which within certain limits is identical at all times and in all places. This interpretation was urgently advocated by Adolf Bauer[3] [1882], as accounting for the wide distribution of the hero myths.

(2) The explanation by original community, first applied by Th. Benfey [Pantschatantra, 1859] to the widely distributed parallel forms of folklore and fairy tales. Originating in a favorable locality [India] these tales were first accepted by the primarily related [namely the Indo-Germanic] peoples, then continued to grow while retaining the common primary traits, and ultimately radiated over the entire earth. This mode of explanation was first adapted to the wide distribution of the hero myths by Rudolf Schubert[4] [1890].

(3) The modern theory of migration, or borrowing, according to which the individual myths originate from definite peoples [especially the Babylonians], and are accepted by other peoples through oral tradition [commerce and traffic], or through literary influences.[5]

The modern theory of migration and borrowing can be readily shown to be merely a modification of Benfey's theory, necessitated by newly discovered and irreconcilable material. The profound and extensive research of modern investigations has shown that not India, but rather Babylonia, may be regarded as the first home of the myths. Moreover the mythic tales presumably did not radiate from a single point, but travelled over and across the entire inhabited globe. This brings into prominence the idea of the interdependence of mythical structures, an idea which was generalized by Braun[6] [1864], as the basic law of the nature of the human mind: Nothing new is ever discovered as long as it is possible to copy. The theory of the elementary thoughts, so strenuously advocated by Bauer over a quarter of a century ago, is unconditionally declined by the most recent investigators [Winckler,[7] Stucken], who maintain the migration theory.

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[3] "Die Kyros Saga und Verwandtes," *Sitzb. Wien. Akad.*, 100, 1882, p. 495.

[4] Schubert. Herodots Darstellung der Cyrussage, Breslau, 1890.

[5] Compare E. Stucken, "Astral mythen," Leipzig, 1896–1907, especially Part V, "Moses." H. Lessmann, "Die Kyrossaga in Europe," *Wiss. beit. z. Jahresbericht d. städt. Realschule zu Charlottenberg,* 1906.

[6] "Naturgeschichte d. Sage." Tracing all religious ideals, legends, and systems back to their common family tree, and their primary root, 2 volumes, Munich 1864–65.

There is really no such sharp contrast between the various theories, and their advocates, for the theory of the elementary thoughts does not interfere with the claims of the primary common possessions and the migration. Furthermore, the ultimate problem is not whence and how the material reached a certain people; but the question is, *where did it come from to begin with?* All these theories would only explain the variability and distribution, but not the origin of the myths. Even Schubert, the most inveterate opponent of Bauer's view, acknowledges this truth, by stating that all these manifold sagas date back to a single very ancient prototype. But he is unable to tell us anything of the origin of this prototype. Bauer likewise inclines to this mediating[8] view and points out repeatedly that in spite of the multiple origin of independent tales, it is necessary to concede a most extensive and ramified purloining, as well as an original community of the concepts, in related peoples. The same conciliatory attitude is maintained by Lessmann, in a recent publication[9] [1908], in which he rejects the assumption of the elementary thoughts, but admits that primary relationship and purloining do not exclude one another.

Leaving aside for the present the enquiry as to the mode of distribution of these myths, the origin of the hero myth in general is now to be investigated, fully anticipating that migration, or borrowing, will prove to be directly and fairly positively demonstrable, in a number of the cases. When this is not feasible, other view points will have to be conceded, at least for the present, rather than barricade the way to further progress by the somewhat unscientific attitude of Winckler,[10] who says: When human beings and products, exactly corresponding to each other, are found at remote parts of the earth, we must conclude that they have wandered thither; whether we have knowledge of the how or when makes no difference in the assumption of the fact itself. Even granting the migration of all myths, the provenance of the first myth would still have to be explained.[11]

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[7] Some of the important writings of Winckler will be mentioned in the course of this article.

[8] *Zeitschrift f. d. Oesterr. Gym.*, 1891, p. 161, etc. Schubert's reply is also found here, p. 594, etc.

[9] Lessmann, "Example and Aim of Mythological Research," *Myths. Bibliot.*, 1, Heft 4, Leipzig.

[10] Winckler, "Die babylonische Geisteskultur in ihren Beziehungen zur Kulturentwicklung der Menschheit," *Wissenschaft u. Bildung*, Vol. 15, 1907, p. 47.

Investigations along these lines will necessarily help to provide a deeper insight into the contents of the myths. Nearly all authors who have hitherto been engaged upon the interpretation of the myths of the birth of heroes find therein a personification of the processes of nature, following the dominant mode of natural mythological interpretation. The new born hero is the young sun rising from the waters, first confronted by lowering clouds, but finally triumphing over all obstacles [Brodbeck, Zoroaster, Leipzig, 1893, p. 138]. The taking of all natural phenomena into consideration, as was done chiefly by the first representatives of this method of myth interpretation;[12] or the regarding of the myths in a more restricted sense, as astral myths [Stucken, Winckler and others]—is not so essentially distinct, as the followers of each individual direction believe to be the case. A step further on this path was taken, however, when the above quoted solar interpretation was no longer accepted and the view was held that all myths were originally lunar myths, as done by G. Hüsing, in his "Contributions to the Kyros Myth" [Berlin, 1906], following out the suggestion of Siecke, who in his latest article [1908][13] also claims this view as the only legitimate obvious interpretation for the birth myths of the heroes, and it is beginning to gain popularity.[14]

The interpretation of the myths themselves will be taken up in detail later on, and all critical comments on the above mode of explanation are here refrained from. Although significant, and undoubtedly in part correct, the astral theory is not altogether satisfactory and fails to afford an insight into the motives of myth formation. The objection may be raised that the tracing to astronomical processes does not fully represent the content of these myths, and that much clearer and simpler relations might be established through another mode of interpretation. The much abused theory of elementary thoughts indicates a practically neglected aspect of mythological research. At the beginning as well as at the end of his contribution, Bauer points out how much more natural and probable it would be to seek the reason for the general unanimity of these myths in very general traits of the human psyche, than in a primary community or in migration. This assumption appears to be more justifiable as such general movements of the human mind are also expressed in still other forms, and in other domains, where they can be demonstrated as unanimous.

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[11] Of course no time will be wasted on the futile question as to what this first legend may have been; for in all probability this never had existence, any more than a "first human couple."

[12] As an especially discouraging example of this mode of procedure may be mentioned a contribution by the well-known natural mythologist Schwartz, which touches upon this circle of myths, and is entitled: "Der Ursprung der Stamm und Gründungssage Roms unter dem Reflex indogermanischer Mythen" [Jena, 1898].

[13] Siecke, "Hermes als Mondgott," *Myth. Bibl.*, Vol. II, Pt. 1, p. 48.

[14] Compare for example, Paul Koch, "Sagen der Bibel und ihre Ubereinstimmung mit der Mythologie der Indogermanen," Berlin, 1907. Compare also the partly lunar, partly solar, but at any rate entirely arbitrary conception of the hero myth, in Gustav Friedreich's "Grundlage, Entstehung und genaue Einzeldeutung der bekanntesten germanischen Märchen, Mythen und Sagen" [Leipzig, 1909], p. 118.

Concerning the character of these general movements of the human mind, the psychological study of the essential contents of these myths might help to reveal the source from which has uniformly flowed at all times, and in all places, an identical content of the myths. Such a derivation of an essential constituent, from a common human source, has already been successfully attempted with one of these legendary motives. Freud, in his "Dream Interpretation,"[15] reveals the connection of the Œdipus fable [where Œdipus is told by the oracle that he will kill his father and marry his mother, as he unwittingly does later on] with the two typical dreams of the father's death, and of sexual intercourse with the mother, dreams which are dreamed by many now living. Of King Œdipus he says that "his fate stirs us only because it might have been our own fate; because the oracle has cursed us prior to our birth, as it did him. All of us, perhaps, were doomed to direct the first sexual emotion towards the mother, the first hatred and aggressive desire against the father; our dreams convince us of this truth. King Œdipus, who has murdered his father Laios, and married his mother Yokaste, is merely the wish fulfilment of our childhood."[16] The manifestation of the intimate relation between dream and myth,—not only in regard to the contents, but also as to the form and motor forces of this and many other, more particularly pathological psyche structures,—entirely justifies the interpretation of the myth as a dream of the masses of the people, which I have recently shown elsewhere ("Die Künstler," 1907). At the same time, the transference of the method, and in part also of the results, of Freud's technique of dream interpretation to the myths would seem to be justifiable, as was defended and illustrated in an example, by Abraham, in his paper on "Dreams and Myths" [1909].[17] The intimate relations between dream and myth find further confirmation in the following circle of myths, with frequent opportunity for reasoning from analogy.

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[15] Shortly to appear in English. Tr. by Brill. Macmillan Co.

[16] The fable of Shakespeare's Hamlet also permits of a similar interpretation, according to Freud. It will be seen later on how mythological investigators bring the Hamlet legend from entirely different view points into the correlation of the mythical circle.

The hostile attitude of the most modern mythological tendency [chiefly represented by the Society for Comparative Mythological Research] against all attempts at establishing a relation between dream and myth is for the most part the outcome of the restriction of the parallelization to the so-called nightmares [Alpträume], as attempted in Laistner's notable book, "The Riddle of the Sphinx," 1889, and also of ignorance of the relevant teachings of Freud. The latter help us not only to understand the dreams themselves, but also show their symbolism and close relationship with all psychic phenomena in general, especially with the day dreams or phantasies, with artistic creativeness, and with certain disturbances of the normal psychic function. A common share in all these productions belongs to a single psychic power, the human imagination. It is to this imaginative faculty—of humanity at large rather than individual—that the modern myth theory is obliged to concede a high rank, perhaps the first, for the ultimate origin of all myths. The interpretation of the myths in the astral sense, or more accurately speaking as "almanac tales," gives rise to the query, according to Lessmann,—in view of a creative imagination of humanity,—if the first germ for the origin of such tales is to be sought precisely in the processes in the heavens;[18] or if, on the contrary, readymade tales of an entirely different [but presumably psychic] origin were only subsequently transferred to the heavenly bodies. In spite of the objections advanced by Lessmann himself against the probability of such an interpretation, we are convinced that the myths,[19] originally at least, are structures of the human faculty of imagination, which at some time were projected for certain reasons upon the heavens,[20] and secondarily transferred to the heavenly bodies, with their enigmatical phenomena. The significance of the unmistakeable traces which this transference has imprinted upon the myths, as the fixed figures, and so forth, must by no means be underrated, although the origin of these figures was possibly psychic in character, and they were subsequently made the basis of the almanac and firmament calculations, precisely on account of this significance.

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[17] In JOURNAL OF NERVOUS AND MENTAL DISEASE, 1912. Also collected as monograph in Monograph Series. Edited by Jelliffe and White.

[18] Stucken [Mose, p. 432] says in this sense. The myth transmitted by the ancestors was transferred to natural processes and interpreted in a naturalistic way, not vice versa. "Interpretation of nature is a motive in itself" [p. 633, annotation].

In a general way it would seem as if those investigators who make use of an exclusively natural mythological mode of interpretation, in any sense, were unable, in their endeavor to discover the original sense of the mythical tales, to get entirely away from a psychological process, such as must be assumed likewise for the creators of the myths. The motive is identical, and led to the same course in the myth creators as well as in the myth interpretators. It is most naïvely uttered by one of the founders and champions of comparative myth investigation, and of the natural mythological mode of interpretation, for Max Müller points out in his "Essays" [1869][18] that his procedure not only invests meaningless legends with a significance and beauty of their own, but it helps to remove some of the most revolting features of classical mythology, and to elucidate their true meaning. This revolt, the reason for which is readily understood, naturally prevents the mythologist from assuming that such motives as incest with the mother, sister or daughter; murder of father, grandfather or brother could be based upon universal phantasies, which according to Freud's teachings have their source in the infantile ideation, with its peculiar interpretation of the external world and its denizens. This revolt is therefore only the reaction of the dimly sensed painful recognition of the actuality of these relations; and this reaction impels the interpreters of the myths, for their own subconscious rehabilitation, and that of all mankind, to credit these motives with an entirely different meaning from their original significance. The same internal conflict prevents the myth-creating people from believing in the possibility of such revolting thoughts, and this defence probably was the first reason for the projecting of these relations to the firmament. The psychological pacifying through such a rehabilitation, by projection upon external and remote objects, can still be realized, up to a certain degree, by a glance at one of these interpretations, for instance that of the objectionable Œdipus fable, as given by a representative of the natural mythological mode of interpretation. Œdipus, who kills his father, marries his mother, and dies old and blind, is the solar hero who murders his procreator, the darkness; shares his couch with the mother, the gloaming, from whose lap, the dawn, he has been born, and dies blinded, as the setting sun [Goldziher, 1876].[21]

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[19] For fairy tales, in this as well as in other essential features, Thimme advocates the same point of view as is here claimed for the myths. Compare Adolf Thimme, "Das Märchen," 2d volume of the Handbücher zur Volkskunde, Leipzig, 1909

[20] Volume II of the German translation, Leipzig, 1869, p. 143.

It is intelligible that a similar interpretation is more soothing to the mind than the revelation of the fact that incest and murder impulses against the nearest relatives are found in the phantasies of most people, as remnants of the infantile ideation. But this is not a scientific argument, and revolt of this kind, although it may not always be equally conscious, is altogether out of place, in view of existing facts. One must either become reconciled to these indecencies, provided they are felt to be such, or one must abandon the study of psychological phenomena. It is evident that human beings, even in the earliest times, and with a most naïve imagination, never saw incest and parricide in the firmament on high,[22] but it is far more probable that these ideas are derived from another source, presumably human. In what way they came to reach the sky, and what modifications or additions they received in the process, are questions of a secondary character, which cannot be settled until the origin of the myths in general has been established.

[21] See Ignaz Goldziher, "Der Mythus bei den Hebräern und geschichtliche Entwickelung" [Leipzig, 1876], p. 125. According to the writings of Seicke ["Hermes als Mondgott," Leipzig, 1908, p. 39], the incest myths lose all unusual features through being referred to the moon, and its relation to the sun. The explanation being quite simple: the daughter, the new moon, is the repetition of the mother [the old moon], with her the father [the sun] [also the brother, the son] becomes reunited.

[22] Is it to be believed? In an article entitled "Urreligion des Indogermanen" [Berlin, 1897], where Siecke points out that the incest myths are descriptive narrations of the seen but inconceivable process of nature, he objects to a statement of Oldenburg ["Religion der Veda," p. 5] who assumes a primeval tendency of myths to the incest motive, with the remark that in the days of yore the motive was thrust upon the narrator, without an inclination of his own, through the forcefulness of the witnessed facts.

(*To be continued.*)

Periscope

Revue de Psychiatrie et de Psychologie Expérimentale

(September, 1911)

1. Chorea and Mental Disorders. L. Marchand.
2. Treatment of Acute and Curable Mental Disorders. H. Damaye.

1. *Chorea and Mental Disorders.*—The author's views are summed up in the following sentence: "Chorea is an organic disease of the brain and the disorders of character which accompany it and which even disappear often with it are also dependent upon cerebral lesions, encephalitis. These disorders of character and of emotivity can be transformed into disorders more grave, consisting of hallucinatory confusion and even of acute delirium. The encephalitis extends and is expressed then by mental accidents of which the gravity is in relation with the intensity of the encephalitis." The article has incorporated two extensive case histories, one case of acute confusion, acute delirium, choreic syndrome, lymphocytosis of the cerebrospinal fluid, and recovery; the other case, one of Sydenham's chorea, mental disorder, dementia præcox.

2. *Treatment of Mental Disorders.*—This article has to do with the construction and administration of hospitals for the insane, the proximity of psychiatric clinics to cities, the separation of the acute from the chronic, etc.

(October, 1911)

1. Definition and Therapeutic Value of Hypnotism. Bernheim.
2. Swiss Letter: The Insane in the Army; The Determination of Periodic Psychoses; Dementia Præcox and Alcoholism. C. H. Ladame.

1. *The Value of Hypnotism.*—The author sums up the results of his paper in the following six general conclusions:

1. Hypnotism is sleep produced by suggestion.

2. The so-called hypnotic phenomena, catalepsy, anesthesia, suggestibility, and hallucinability, exist as well among suggestible subjects, in the waking state.

3. The hypnotic sleep has not any particular property; it does not differ at all when it is real from natural sleep.

4. Hypnotism has no special therapeutic virtues.

5. Induced sleep may be useful and indicated for certain cases.

6. In a general way psychotherapy in the hypnotic state is not more efficacious than in the waking state.

2. *Swiss Letter: The Insane in the Army, etc.*—The author believes that every army should have physicians trained in psychiatry.

The author quotes a work by Garczynski, who concludes that the manic-depressive psychosis, in common with all psychoses that recur a number of times, may issue in dementia, and that this issue does not by any means indicate that the disease is dementia præcox.

The author calls attention to the work of Graeter, who has demonstrated that many of the cases that are apparently alcoholic on the surface are really something else and that alcoholism frequently serves to cloud a præcox diagnosis.

(November, 1911)

1. Cretinism. M. Ducosté.
2. An Observation of Mythomania: Medico-legal Contribution to the Subject of Mythomania. Rogues de Fursae.

1. *Cretinism.*—To be continued.

2. *Mythomania.*—This is a long report of a case with medico-legal comments.

(December, 1911)

1. Melancholia and Manic-Depressive Psychosis. N. G. Genil-Perrin.
2. Cretinism. Ducosté.

1. *Melancholia.*—This is a critical review of a work of Monsieur Guido Ruata. M. Ruata's conclusion is that melancholia is a clear cut distinct clinical entity and should be distinguished from manic-depressive psychosis by the lack of degenerative and hereditary elements, by its appearance at an advanced age, by the absence of motor and psychic inhibitions, and by the existence of crises of anxiety with delirious ideas, and by an altogether different evolution.

2. *Cretinism.*—This is an extensive article which takes up a quite complete review of the whole situation. It is hardly possible to abstract it in a short space. The author quotes Birchr approvingly, in conclusion, that following the terminology of Ostwald that the etiology of cretinism is a question of colloidal chemistry.

White.

Brain

(Vol. 34, Parts 2 and 3)

1. The Inborn Factors of Nervous and Mental Disease. F. W. Mott.
2. Sensory Disturbances from Cerebral Disease. Henry Head and Gordon Holmes.
3. A Case of Lesion of the Optic Thalamus, with Autopsy. Gordon Holmes and Henry Head.
4. The Response of Normal and Abnormal Muscles to Leduc's Interrupted Current. Otto May.

1. *The Inborn Factors of Nervous and Mental Disease.*—Dr. Mott here presents a very extensive article devoted to a consideration of nervous and mental disease heredity. This he defines as essentially a mechanism for preserving that which has been won by progressive evolution and natural selection, and every species has probably reached an unchangeable type, in which the inheritance has become more or less perfected and fixed; there is in consequence continuity of germ plasm. By the laws of heredity the germ plasm has acquired a fixity in stability of characters of the species: the race, the sex, and to a much less degree of ancestral stocks, thus preventing the organs and structures of the body from varying in any considerable degree from the normal average which has been attained by evolution. Mott then gives a discussion of the theories of heredity, first taking up Galton's general principles and then

expounding Mendelism. He then gives a number of interesting pedigrees of Huntington's chorea, of hereditary depressions, epilepsies, drunkenness, glaucoma, diabetes, and general defects. He lays some stress upon what he calls the "law of anticipation." This is that general principle which shows that in hereditary transmission younger and younger individuals are affected in the succeeding generations. Mott thinks that this law of anticipation is more apt to show itself in nervous and mental disease. He presents a large statistical study with reference to this, unfortunately using the term "insanity" as though it were one thing. The work is well worth reading, especially in conjunction with other studies that he has made on this same subject.

2. *Sensory Disturbances from Cerebral Lesions.*—This extensive, and extremely valuable paper, which is called a preliminary communication, should be read in the original. We present a lengthy summary.

They say that it is a matter of universal belief that man has evolved from the lower animals, and yet when we deal with sensation and sensory processes, we speak as if he were created with peripheral end organs capable of reacting to one of the sensory qualities of human experience. The impulses starting in these end-organs are supposed to pass unaltered to the brain, there to set up that peculiar and unknown change which underlies a specific sensation.

Spots were found on the skin sensitive to touch, to pain, to heat, or to cold only. With the discovery of these highly developed end organs, the doctrine of specific nerve energy seemed to be proved in the strictest manner. All other forms of sensory appreciation were supposed to be produced by the psychical transformation of these primitive sensory elements, in association with an ill-defined faculty called the "muscle sense." Recognition of the locality of a stimulus, and the posture of the limbs were attributed to judgment and association.

But alongside the systematic investigation of von Frey, and others, of the capabilities of these specific areas in the skin the clinicians were discovering the importance of "muscular sensibility." Sherrington's demonstration of afferent fibers in muscles and tendons placed the existence of the "muscle sense" beyond a doubt, and the use he made of these afferent impulses from deep structures, in his theory of the proprioceptive system, necessitated a complete exploration of the nature of deep sensibility.

By their experiment directed to this end, Rivers and Head showed that beneath the skin, independent of all "touch" and "pain spots," lies an afferent system capable of a wide range of functions. Pressure, that in ordinary life would be called a touch, can be appreciated and localized with considerable accuracy. Increase of pressure, especially on bones and tendons, will cause pain. Moreover, it is from the impulses of this deep afferent system that we gain our knowledge of the posture of the limbs and the power of recognizing passive movements.

Evidently, therefore, the peripheral mechanism of sensation is less simple than was at first supposed. For there are two sets of end organs, that can respond to tactile stimuli, and two independent mechanisms for the initiation of pain. Further analysis showed that the peripheral apparatus in the skin, by which we become conscious of the nature of external stimuli, is highly complex. No one sensory quality is subserved by a single set of end organs, but every specific sensation is the result of the combined activity of more than one group. This is exactly the result that might have been expected, when we bear in mind that the structure of man is the product of a long evolution.

But it is equally obvious, from an evolutionary standpoint, that these diverse impulses could not pass uncombined to the highest physiological level. Within the spinal cord, the opportunist grouping of the periphery gives place to an arrangement according to quality (Head and Thompson). All impulses capable of generating pain become grouped together in the same path, and can be disturbed simultaneously by an appropriate lesion of the spinal cord.

The most remarkable condition revealed by an intramedullary lesion is the complete separation of the impulses underlying the appreciation of posture, the discrimination of two points, and their correlated faculties from those of other sensory groups. All painful and thermal impulses coming from the periphery undergo regrouping after entering the spinal cord, and, whether they arise in the skin or in deeper structures, become arranged according to functional similarity. Then, after a longer or shorter course, they pass away to the opposite side of the spinal cord.

This process of filtration leaves all the impulses associated with postural and spacial recognition to continue their course unaltered in the posterior columns; they are the survivors of peripheral groups broken up by the passing away of certain components into secondary afferent systems. At any point in the spinal cord these columns transmit not only impulses from the periphery which are on their way, after a shorter or longer passage, to regrouping and transformation, but at the same time they form the path for impulses, arising both in the cutaneous and deep afferent systems, which undergo no regrouping until they reach the nuclei of the medulla oblongata.

Thus, a lesion confined to one half of the spinal cord, even at its highest segment, may interfere with the passage of sensory impulses, some of which are traveling in secondary paths, while others are still within the primary level of the nervous system. All impulses concerned with painful and thermal sensations from distant parts, disturbed by such a lesion, will be traveling in secondary paths and will have come from the opposite half of the body; for, after regrouping, they have passed across the spinal cord. But those impulses underlying the appreciation of posture, the compass test, size, shape, form, weight, consistence, vibration, will be affected on the same half of the body as the lesion. They still remain in paths of the peripheral level and have undergone no regrouping.

In such a case the parts on the side opposed to the lesion may be insensitive to pain, heat and cold; but all the postural and spacial aspects of sensation will be perfectly maintained. Yet, all power of recognizing position, of estimating size, shape, form and weight, or of discriminating the two compass points, will be lost in the limbs which lie on the side of the lesion, although tactile sensibility and localization of the spot stimulated may be perfectly preserved.

This remarkable arrangement enables one to analyze the nature of the peripheral impulses upon which depend our power of postural and spacial recognition. Obviously, even at the periphery, they must be independent of touch and pressure. The power to distinguish two points applied simultaneously and to recognize such size and shape, requires as a preliminary the existence of sensations of touch; but the patient may be deprived of all such powers of spacial recognition without any discoverable loss of tactile sensibility. In the same way, our power to appreciate the position of a limb, or to estimate the weight of an object, is based upon impulses which, even at the periphery, exist apart from those of touch and pressure called into simultaneous being by the same external stimulus.

This long delay of the postural and spacial elements in reaching secondary paths enables them to give off afferent impulses into the spinal and cerebellar coördinating mechanisms, which lie in the same half of the spinal cord. The impulses which pass away in this direction are never destined to enter consciousness directly. They influence coördination, unconscious posture and muscular tone, and, although arising from the same afferent end organs, they never become the basis of a sensation.

Finally, the last survivors of these impulses from the periphery become regrouped in the nuclei of the posterior columns and cross to the opposite half of the medulla oblongata in paths of the secondary level. So they pass to the optic thalamus and thence to the cortex, to underlie those sensations upon which are based the recognition of posture and spacial discrimination.

Disturbances of sensibility in lesions of the brain stem.—In speaking of diseases of the brain stem special problems of diagnosis of extreme difficulty, so far as the analysis of the sensory disturbances is concerned, are offered. So long as the sensory paths were in their spinal route they were capable of a certain amount of isolation either as they entered the cord and made their first synopses, or as they continued up the cord in primary or secondary paths. But as these paths converge to enter the brain stem they become closer anatomically, disease processes are apt to overrun many paths, and thus the analysis becomes increasingly difficult up to the entering of these paths into the optic thalamus.

Head and Holmes hold that the impulses underlying sensations of pain, heat, and cold seem alone to run unaltered, either directly or by intercallated fibers associated with the ganglion cells of the formatio reticularis, between the upper end of the spinal cord and the optic thalamus. Here are received the regrouped secondary impulses from the face which cross and join the specific paths for pain, for heat or for cold. These paths are so situated that they can be interrupted without disturbance of any other form of sensation on the body, and the analgesia and thermo-anesthesia so produced resemble in quality the loss of sensation to pain, heat and cold caused by a lesion in the spinal cord.

Thus when a lesion of the bulb interferes with sensation of pain, not only may the skin be insensitive to prick, but the readings of the pressure algometer may be raised on the analgesic side. In the same way the affected area of the body may be insensitive to all degrees of heat, and to all stimuli capable of evoking normally a sensation of cold. Here, however, in the bulb, in distinction to lesions of the cord, the grosser form of pain and discomfort may traverse other paths if the usual ones are closed —whereas in the cord all painful impulses are blocked by an equivocal lesion.

In the bulb moreover all three forms of sensibility may be affected together or any one may escape or be alone involved.

These impulses of pain, heat and cold all run up in the neighborhood of the fifth nerve nucleus, and in cases of occlusion of the posterior cerebellar artery the paths are usually implicated. This same accident may occasion a dissociation of the impulses underlying the appreciation of posture and passive movement from those concerned with spatial discrimination.

A summary of the findings which may occur in the lesions which cut off the sensory pathways between the nuclei of the posterior columns and the optic thalamus has been stated by Head and Holmes as follows:

1. The impulses for pain, heat and cold continue to run up in separate secondary paths on the opposite side of the nervous system to that by which they entered. They receive accessions from the regrouped afferent impulses from the nerves of the head and upper part of the neck.

Although these paths are frequently affected together, they are independent of one another, and any of the three qualities of sensation may be dissociated from the others by disease.

2. Lesions of the spinal cord tend to diminish simultaneously all forms of painful sensibility, but with disease of the brain stem the gross forms of pain and discomfort may pass to consciousness, although the skin is analgesic. This applies not only to painful pressure but to the discomfort produced by excessive heat.

3. The impulses concerned with postural recognition part company with those for spacial discrimination at the posterior column nuclei. Up to this point, they have traveled together in the same column of the spinal cord, but as soon as they reach their first synaptic junction they separate. Above the point where they enter secondary paths, the power of recognizing posture and passive movements can be affected independently of the discrimination of two points and the appreciation of size, shape and form in three dimensions.

4. It would seem as if those elements which underlie the power of localizing the spot touched or pricked become separated off from their associated tactile impulses before they have actually come to an end in the optic thalamus. The long connection of localization with the integrity of tactile sensibility is here broken for the first time.

All these changes are preparatory to the great regrouping which takes place in the optic thalamus.

The thalamic syndrome and sensory changes in disorders of the thalamus are next taken up in this paper. Practically the entire mass of sensory fibers carrying impulses of all kinds—the tests for most of which have already been outlined—have synaptic junctions within the optic thalamus. No note has been made here of the numerous fibers coming from the chemical receptors of the respiratory, gastrointestinal, or genito-urinary tract, nor those from the organs of internal secretion, nor even of the sympathetic—all of these make up an enormous terra incognita for the future explorer.

Lesions in and about the thalamus cause sensory symptoms, as well as motor ones, of a very characteristic nature—so much so that one can speak of a special thalamic syndrome. Such a syndrome was first described by Dejerine and his pupils, particularly by Roussy, who devoted a monograph to the subject.

Here one observes the following notable features:

1. A persistent loss of superficial sensation of one half of the body and face. This loss to touch, pain, and to temperature is more or less definite, subject to considerable variation and to partial recovery, but the loss of deep sensibility, deep pressure, postural sense, etc., is much more pronounced, and is more apt to persist. This latter is usually more marked distally and in many instances diminishes as one approaches the trunk.

2. There is slight hemiataxia and more or less complete astereognosis.

3. There are in the complete syndrome acute pains on the affected side which are very persistent, coming on in paroxysms. They are frequently extremely severe and rarely respond to the ordinary analgesics. These pains may involve a single member, may be limited to the side of

the face, simulating a trigeminal neuralgia, or they may involve one whole side of the body.

4. There is usually a more or less distinct though slight hemiplegia, which in the unmixed syndromes rapidly clears up. Contractures rarely develop in the pure syndrome. In the mixed syndrome—with extension of the lesion to the external capsule—contractures may be present.

5. Choreic, athetoid, or paralysis agitans-like movements may be present on the affected side. These are the symptoms which permit one to diagnose a lesion of the optic thalamus and its surrounding parts, but in addition to these Head and Holmes have pointed out an extremely suggestive series of affective reactions which are due to lesions in the optic thalamus. They have opened up an attack upon the analysis of the sensory content of emotional reactions. They show that in thalamic lesions there is a tendency to react excessively to unpleasant stimuli. The prick of a pin, painful pressure, excessive heat or cold, all produce more distress than on the normal half of the body. Thus, in one of Head and Holmes' patients, if a pin is dragged lightly across the face or trunk from the sound to the affected side, there is felt an excessive discomfort as it passes the middle line. She not only complained that it hurt her, but the face was contorted with pain, and all this notwithstanding the fact that she was less able to distinguish head from point, yet the prick hurt her more. This very anomalous state of affairs is a purely thalamic reaction.

This excessive reactivity is seen not only to pin prick, but also to deep pressure, to extremes of heat and cold, to visceral stimulation, to scraping, roughness, vibration, tickling, to pleasurable stimuli, and to ideational emotional states. Not all patients show all of these reactions, but in practically ninety per cent. of the thalamic cases examined by Head and Holmes excessive affective response to one or more measured stimuli were found. For heat and cold, and other forms of sensibility as well as for pain the excessive response may be present, and yet the patients are unable to detect—*i. e.*, are anesthetic to—the stimulus itself. So far as the ideational affective reaction is concerned these patients express themselves as follows: On hearing affecting music "a horrid feeling came on in the affected side, and the leg screwed up and started to shake." The singing of a comic song left one patient absolutely cold, but a tragic song produced a very distinct unpleasant effect. One patient said "my right hand seems to crave sympathy, my right side seems more artistic." In practically all of the cases the increased affective reaction was accompanied by actual sensory loss.

A more detailed study of the loss of sensibility in thalamic disorders made by Head and Holmes revealed the following: No sensory functions are so frequently affected as the appreciation of posture and the recognition of passive movement. The amount of this loss varies greatly from a scarcely measurable defect to complete want of recognition of the posture of the limbs of the abnormal half of the body.

Tactile sensibility is frequently diminished; but, excepting in a few cases where all appreciation of contact was destroyed, a threshold could be obtained. It was always possible to show that increasing the strength of the stimulus improved the proportion of right answers unless the observations were confused by the disagreeable tingling or other accessory sensations.

Localization of the spot touched was defective in half the cases where sensation was sufficiently preserved to carry out accurate tests. This inability to recognize the site of simulation was equally great, whether the patient was pricked or touched. In cases where localization was gravely affected, the disagreeable sensation, so easily evoked, tended to spread widely on the abnormal half of the body. A prick on the hand may cause an extremely painful sensation in the cheek or side, and sometimes the patient simply recognized the stimulus as a change within himself, and did not refer the discomfort from which he suffered to the action of any external agent.

Sensibility to heat and cold may show all degrees of change from total loss to a slight increase of the neutral zone. Heat and cold are not dissociated; and if one form of sensation is lost, the other will be gravely disturbed. The apparent exceptions arise from a misinterpretation of the sensation evoked by high or low temperatures on the affected half of the body.

Not infrequently the compass test cannot be carried out because of the gross loss of sensation and inability to recognize contact; but whenever this method can be applied a threshold can be worked out, and widening the distance between the points increases the accuracy of the answers.

The power of estimating the relation between two weights is frequently disturbed on the abnormal half of the body. If the appreciation of posture and movement is affected, the patient can no longer recognize the identity or the difference of two weights placed in the unsupported hands. But so long as tactile sensibility is not diminished, he can still estimate the relation between weights applied one after the other to the same spot, and can recognize the increase or diminution in weight of an object already resting on the hand.

The appreciation of relative size is often disturbed in these cases, but with care it is usually easy to demonstrate a difference threshold. Shape and form in three dimensions are frequently not recognizable on the affected hand. But, if tactile sensibility is not grossly affected, the patient usually retains an idea that the object possesses a form, and may obtain a considerable percentage of right answers.

Vibration of the tuning fork is recognized by all but three of our patients. In almost every case, however, the length of time during which it was appreciated was shorter, and sometimes the rate of vibration was thought to be slower on the affected half of the body.

Roughness, as tested with Graham Brown's esthesiometer, was always recognized, except in three cases where the loss of all forms of sensation was unusually severe. Usually the threshold was the same on the two sides, but it was occasionally raised on the affected hand.

Sensory disturbances due to cerebral lesions is treated in the final section. The sensory paths from the thalamus to the cortex undergo a new distribution, thus making at least five distinct regroupings of the sensory phenomena in the entire course of the sensory neuron. The analysis of the phenomenon introduces more complex factors, and the necessity for abandoning all generalizations, even those more refined, that anesthesia, analgesia, as, for instance, light touch, cutaneous sensations, etc., become more apparent. Newer valid terms may be coined, but one is here forced to state the results in terms of the tests employed.

1. Using graduated tactile stimuli such as van Frey's hairs, and the pressure esthesiometer, Head and Holmes have found as follows:

A cortical lesion may reduce the accuracy of response from the affected part to graduated tactile stimuli.

The form assumed by this defective sensibility differs from that produced by lesions at other levels of the nervous system. For the affected part may respond to the same graduated hair as the normal hand; but this response is irregular and uncertain. Increasing the stimulus may lead to no corresponding improvement, and even the strongest tactile hair may occasionally evoke less certain answers than a hair of much smaller bending strain. Moreover, a touch with the unweighted esthesiometer may be as effective at one moment as the same instrument weighted with 30 gm. at another. In such cases no tactile threshold can be any longer obtained.

2. This irregularity of response is associated with persistence of the tactile sensation and a tendency to hallucinations of touch.

Where the sensory defect is not sufficiently gross to abolish the threshold, persistence, irregularity of response and a tendency to hallucinate may still disturb the records.

3. In all cases where tactile sensibility is affected, whether a threshold can be obtained or not, fatigue is induced with unusual facility. Although the patient may cease to respond to tactile stimuli over the affected part in consequence of fatigue, his answers may remain as good as before from the normal parts. The fatigue is local and not general.

4. With stationary cortical lesions, uncomplicated by states of shock or by " diaschisis," sensibility to touches with cotton wool is never lost over hair-clad parts. Over hairless parts, stimulation with cotton wool may produce a sensation which seems " less plain " to the patient and his answers may show the same inconstancy so evident when he is tested with graduated tactile stimuli.

For measured painful stimuli they found that a pure cortical lesion leads to no change in the threshold to measurable painful or uncomfortable stimuli. Nor does the patient express greater dislike to these stimuli on one side than on the other. A prick may be said to be " plainer " or " sharper " on the normal than on the affected side; but this is due to a defective appreciation of the pointed nature of the stimulus and bears no direct relation to the painfulness of the sensation evoked.

The temperature tests they found as follows:

1. The neutral zone within the stimulus was said to be neither hot nor cold, was considerably enlarged in comparison with that observed on similar normal parts of the same patient.

2. The patient complained that although he recognized correctly the nature of the stimulus, it seemed " less plain " than over normal parts. His answers were less constant and less certain; a temperature recognized without difficulty at one time seemed doubtful at another.

3. The power of discriminating the relative coolness of two stimuli, or the relative warmth of two hot tubes may be diminished. Thus 20° C. may be said to be the same as ice, although both are uniformly called cold, and 40° C. may seem as warm as, or even warmer than 48° C. The faculty of appreciating the relation to one another of two temperatures on the same side of the scale is disturbed.

For recognition of posture and for passive movements they found that:

1. Cortical lesions most frequently disturb the recogniton of posture and of passive movements. Whenever sensation is in any way affected in consequence of a cortical lesion these two functions suffer.

2. In all their cases the disturbance in the faculty of recognizing posture and passive movements was greater toward the peripheral parts of the affected limb.

3. When a patient with unilateral disturbance of these faculties attempts to point to some part of his body, defective knowledge of its position causes greater error than want of recognition of posture and movement in the hand with which he points.

4. When testing the patient's power of appreciating passive movement, the answers are frequently uncertain and hallucinations of movement may occur. And yet the patient may be remarkably consistent and accurate when normal parts are tested.

5. Localization tests showed:

(*a*) The power of localizing the stimulated spot is not infrequently preserved, although sensation may be otherwise disturbed as a consequence of cortical lesions.

(*b*) This faculty is independent of the power of recognizing the position of the affected limb; appreciation of posture may be lost, although localization is not in any way diminished.

(*c*) If the power of localization is lost, the patient will be unable to recognize not only the position of a spot touched but also the position of a prick.

(*d*) When localization is defective in consequence of cerebral lesions, the patient does not habitually localize in any particular direction, but ceases to be certain where he has been touched or pricked.

6. The compass test revealed that:

(*a*) A cortical lesion may destroy the power of discriminating two compass points, both when applied simultaneously and collectively.

If this is the case, no threshold can be obtained for either form of the test; increasing the distance between the points does not constantly improve the accuracy of the answers.

(*b*) This disturbance is not caused by changes in tactile appreciation; for it can be demonstrated equally well with two painful as with two tactile stimuli.

(*c*) The condition of tactile sensibility and the accuracy of the simultaneous compass-test are closely associated; a disturbance of the tactile threshold is usually accompanied by a raised threshold for the appreciation of two points applied simultaneously.

(*d*) Should the power be preserved of recognizing two points when the compasses are applied consecutively, localization will be found to be intact. The patient's appreciation of the two points when they are separated by an interval of time is due to the recognition of the separate locality of the two spots touched.

7. Appreciation of weights showed that:

(*a*) The power of estimating the relative of two objects of the same size and shape is readily disturbed by cortical lesions.

(*b*) Though the patient may retain sensations of contact when the weight is placed in his hand, all power of recognizing the relative heaviness of the object has disappeared.

(*c*) This faculty is equally disturbed in most cases whether the weights are placed on the supported or the unsupported hand.

From these and related studies, it would appear that sensory impulses pass from the thalamus to the cortex in five groups:

1. Those concerned with the recognition of posture and passive movement. If these impulses are affected the power of discriminating weights on the unsupported hand may be also diminished.

2. Certain tactile elements; integrity of this group is necessary for the discrimination of weights placed on the fully supported hand.

3. Those impulses which underlie the appreciation of two points applied simultaneously (the compass test); on this group also depends the recognition of size and shape.

4. Those which underlie the power of localizing the situation of a stimulated spot. Recognition of the double nature of two points applied consecutively also depends on this group of impulses.

5. All thermal impulses are grouped together to underlie a scale of sensations with heat at the one end and cold at the other. At the level with which we are now dealing these impulses have already excited the affective center and are passing away to the cortex.

Head and Holmes believe that the functional integrity of the cortex enables attention to be concentrated upon those changes which are produced by the arrival of afferent impulses. When this is disturbed, some impulses evoke a sensation, but others from lack of attention do not affect consciousness. Attention no longer moves freely over the sensory field to be focused successively on fresh groups of sensory impressions. Sensations, once evoked, are not cut short by the moving away of the focus of attention as when cortical activity is perfect. Hence arise persistent sensations and hallucinatons which are so prominent a feature after lesions of the cortex.

They believe that the cerebral cortex is the organ by which we are able to focus attention upon the changes evoked by sensory impulses. A pure cortical lesion, which is not advancing or causing periodic discharges, will change the sensibility of the affected parts in such a way that the patient's answers appear to be untrustworthy. Such diminished power makes the estimation of a threshold in many cases impossible. Uncertainty of response destroys all power of comparing one set of impressions with another and so prevents discrimination.

But in addition to its function as an organ of local attention the sensory cortex is also the storehouse of past impressions. These may rise into consciousness as images, but more often, as in the case of spacial impressions, remain outside central consciousness. Here they form organized models of ourselves which may be termed "schemata." Such schemata modify the impressions produced by incoming sensory impulses in such a way that the final sensations of position, or of locality, rise into consciousness charged with a relation to something that has happened before. Destruction of such "schemata" by a lesion of the cortex renders impossible all recognition of posture or of the locality of a stimulated spot in the affected part of the body.

In daily life all stimuli excite more or less both thalamic and cortical centers, for most unselected sensations contain both affective and discriminative elements. But, among the tests employed in sensory analysis, some appeal almost entirely to the one or the other center. The test for recognition of posture, as carried out by Head and Holmes, is purely discriminative; while the pain produced by squeezing the testicle, or to a less degree by the pressure algometer, appeals almost exclusively to the more affective center.

Sensory impulses arriving at the optic thalamus are regrouped in such a way that they can act upon both its essential center and the sensory cortex. The essential organ of the thalamus is excited to affective activity by certain impulses, and refuses to react to those which underlie the purely discriminative aspects of sensation. These pass on to influence the cortical centers where they are readily accepted. In a similar way, the primary centers of the cortex cannot receive those components which underlie feeling tone; in this direction they are completely blocked.

It has long been recognized that sensations are endowed with feeling tone to different degrees. In those which underlie postural appreciation this quality is entirely absent, while visceral sensations are, in some instances, little more than a change in a general feeling tone, one set of impulses appeals almost exclusively to the cortical center, the other to that of the optic thalamus. All thermal stimuli, however, make a double appeal. Every sensation of heat or cold is either comfortable or uncomfortable; the only entirely indifferent temperature is one that is neither hot nor cold.

In the same way, some unselected tactile stimuli appeal both to the sensory cortex and to the optic thalamus. For not only is a touch always related to, and distinguished from, something that has gone before it, but we have shown that contact, especially of an object moving over hair-clad parts, is capable of exciting thalamic activity. Vibrations of the tuning fork also make a double appeal, for when the cortical paths are cut the amplitude of the vibration must be greater in order that it may be appreciated; on the other hand, the vibratory effect may be stronger on the abnormal side in those thalamic cases where the affective response is excessive.

But these two centers of consciousness are not coequal and independent. Under normal conditions the activity of the thalamic center, though of a different nature, is dominated by that of the cortex. When we examine the sensation normally produced by a prick, we recognize that the pain develops slowly and lasts a considerable time after the stimulus has ceased. Moreover, the same intensity of stimulation will produce a different effect on the same spot on different occasions. A long, latent period, persistence and want of uniformity, are characteristic of all painful sensations. This is seen in an exaggerated form in cases where the thalamic center has been freed from control. The response to prick is slow, but persists long after the stimulus has ceased. Moreover, the reaction, when it occurs, tends to be explosive; it is as if a spark had fired a magazine and the consequences were not commensurate with the cause.

On the contrary, the sensations normally produced by moderate tactile stimuli are characterized by a short latent period, and disappear almost immediately on the cessation of the stimulus. A lesion of the sensory cortex disturbs both these characteristics. Tactile sensations become uncertain and incalculable, and no threshold can be obtained; persistence and hallucinations mar the uniformity of the records.

Now we have shown that the sensory cortex is the organ by which attention can be concentrated on any part of the body that is stimulated. The focus of attention is arrested by the changes produced by cortical activity at any one spot. These are sorted out and brought into relation with other sensory processes, past or present. Then the focus of attention sweeps on, attracted by some other object.

All stimuli which appeal to the thalamic center have a high threshold. They must reach a high intensity before they can enter consciousness, but once they have risen above the threshold they tend to produce a change of excessive amount and duration, and this is the business of the cortical mechanism to control. The low intensity of the stimuli that can arouse the sensory cortex, and its quick reaction period, enable it to control the activity of the cumbersome mechanism of the thalamic center.

The view of the sensory mechanism put forward in their paper explains many of the facts already recognized by both psychologists and clinicians. It enables us to understand how integrations can occur at all afferent levels of the nervous system, and makes development possible even in the individual. The aim of human evolution is the domination of feeling and instinct by discriminative mental activities. This struggle on the highest plane of mental life is begun as the lowest afferent level, and the issue becomes more clearly defined the nearer sensory impulses approach the field of consciousness.

3. *Lesion in Optic Thalamus.*—In this paper, the authors present a study of the thalamic syndrome which agrees in all essential parts with that described by Dejerine and Roussy. The case history, summarized, is as follows: "A man, aged 49, with chronic Bright's disease, and hypertrophy of the heart, suffered from three strokes at short intervals, without loss of consciousness, the last more than two months before his death. There was little or no paralysis, and the reflexes remained normal, but he suffered with severe pains throughout the whole of his rght side, associated with almost complete loss of tactile and postural sensibility on this side. The threshold for painful stimuli was much raised, though certain forms of discomfort, when evoked, were more severe, less bearable, and produced a greater reaction. The appreciation of temperature was abolished, but thermal stimuli below 20° C., and above 55° C. produced more discomfort than on the normal side, and an excessive reaction. There was also loss of the ability to appreciate weight, size, shape and form. He had bilateral deafness, greater on the side opposite to the lesion, as a result of the strokes. On post mortem examination an extensive softening was found in the ventral and lateral regions of the left optic thalamus in which the fillet terminates. The greater portion of the softening, however, formed a narrow cleft in the lateral zone of the thalamus separating it from the internal capsule. The internal nucleus of the thalamus was very little affected. It is evident that both the clinical symptoms and the anatomical lesion in this case conform closely to those of the type described by Dejerine and Roussy."

In addition to the symptoms which are classical for the syndrome, Holmes and Head report another clinical feature of these cases. They say: "This is a tendency for certain stimuli, generally of the unpleasant order, to produce more pain and discomfort on the affected than on the normal side of the body, despite the diminution of sensibility. In our own case, almost all stimuli that could evoke a sensation had this effect; pricks when they affected consciousness, it is true, produced only a greater reaction, but sensibility to this form of stimulation was very low. With painful pressure, however, the excessive discomfort and reaction were very pronounced; while high and low temperatures, which were recognized only as painful or unpleasant stimuli, had the same effect. Roussy refers to this phenomenon as "dysesthésie." In his first case prick evoked numbness and disagreeable sensations: there was "hyperesthesia" to cold, and even the tuning-fork produced a sensation of "intense burning." In a second case prick produced a painful numbness that was badly localized, and heat above 50° C. evoked pain. In another case he observed that tickling was extremely unpleasant to the patient, and in his last recorded case even stroking the skin or hairs was painful, and thermal stimuli evoked tingling. In Edinger's case even touch was painful and cold was unbearable, and in Greiff's hyperesthesia was observed.

Winkler and van Londen found that pinching or squeezing evoked "a much sharper perception of pain" on the affected than on the normal side, and this was associated with "vehement repelling movements." In fact, in two only of these ten cases, in those recorded by Long, was there no mention made of this tendency for affective stimuli to evoke pain and discomfort. The significance of this over-response has already been discussed in the preceding abstract.

4. *Leduc's Current and Muscle Response.*—The author found that the Leduc method offered some valuable information concerning the electrical reactions of muscles other than those known for years resulting from the work of Duchenne and Erb. As the results obtained can only be appreciated by a study of the many graphic curves introduced, an abstract is unavailing.

JELLIFFE.

MISCELLANY

SPINAL ANALGESIA. W. S. Bainbridge. (Journal A. M. A., November 23.)

The history and methods of spinal analgesia and deductions therefrom, together with the experience in 1,065 cases, form the subject of this paper. He enumerates the three general classes of solutions. First, the so-called "diffusible" solution employed by Babcock, in which alcohol is used to render the fluid lighter than the cerebrospinal fluid. To the second class belong the simple solutions of the analgesic agent with water, with water plus cerebrospinal fluid, with cerebrospinal fluid alone, or with normal salt solution. To the third class belong the so-called "non-diffusible" solutions, which are rendered heavier than the cerebrospinal fluid by the addition of glucose, dextrine or gum arabic. In 988 cases solutions of the second class were employed and in 500 of these cocain was used. He now uses, as a rule, stovain or tropacocain, but does not hesitate to employ cocain. In the total number there was one death, probably due to status lympnaticus. One case of temporary partial paralysis occurred, one of failure due to so-called dry spine, two cases with alypin in which there was considerable respiratory depression and one where failure to produce anesthesia was apparently due to idiosyncracy. Illustrative cases in which the three classes of solutions were employed are reported, and the methods and apparatus for the use of the solutions are described. From all the known facts it may be deduced in a general way that the indications for spinal analgesia are the contra-indications for inhalation anesthesia. The operation is practicable but a person already in marked shock, or profoundly septic should not be subjected to this procedure. The real objections Bainbridge says to the method are in his opinion: "1. The operator is absolutely committed to the dose, whatever it be. It can be increased by an additional injection, but it cannot be decreased once given. With the changes in the position of the patient, with carefully graded dosage, control can be exercised. 2. In prolonged operations the analgesic effect may pass before the surgical procedure is finished. In some cases, as in laparotomy, it is quite inconvenient to turn the patient over for another injection." It is not an operation for the surgical novice and must continue to occupy a somewhat limited sphere until we know more as to the physiologic action of the agents employed and of their dosage to obtain the desired results.

Book Reviews

PSYCHIATRIE. Von Prof. Dr. med. et Phil. Th. Ziehen, of Berlin. Vierte vermehrte Auflage. S. Hirzel, Leipzig.

The fourth edition of Professor Ziehen's work represents the final fruition of the school of psychiatry of which he was the founder and most eminent exponent. It is the school that sought the roots of its concepts in normal psychology and although with Professor Ziehen's retirement from Berlin and the advent of other methods in psychiatry this school will probably cease to exert any active interest still in Professor Ziehen's hands the methods that he elaborated produced splendid results. A pedagogue by nature and an indefatigable worker he inspired many students by his enthusiasm and he will remain a positive influence in psychiatry through them for some years to come while he will always retain a position of eminence in this department of medicine.

WHITE.

ZUR PSYCHOPATHOLOGIE DES ALLTAGSLEBEN. UEBER VERGESSEN, VERSPRECHEN, VERGREIFEN, ABERGLAUBE UND IRRTUM. Von Prof. Dr. Sigmund Freud, in Wien. Vietre vermehrte Auflage. S. Karger, Berlin.

This is the fourth edition of Professor Freud's work on the psychology of everyday life which has become so well known and has been so widely reviewed that hardly more than passing notice of a new edition is required. The work represents the application of Professor Freud's principles of psychoanalysis to a multitude of problems in the psychology of everyday life which have hitherto been considered umuport or accidental. It shows how slips of the tongue, forgetting, and various minor errors of conduct really express fundamental elements in the individual's make-up by an analysis of which the avenues are opened to matters of great importance in the psychic life.

The work stands as an absolute refutation of the commonly accepted beliefs that in the mental sphere at least accident may reign and as such is a distinct contribution to the new developments in dynamic psychology.

It is our understanding that an English translation is in preparation and will shortly appear. It should be welcomed by all students of mental phenomena.

WHITE.

Notes and News

Doctor H. W. Powers has resigned his position as medical superintendent of the Kenilworth Sanitarium, Kenilworth, Illinois, to engage in general practice in Wilmette, Illinois.

The position made vacant at the Kenilworth Sanitarium by Doctor Powers' resignation has been filled by the appointment of Doctor Sherman Brown, formerly assistant physician of the Kings Park State Hospital at Kings Park, Long Island, New York.

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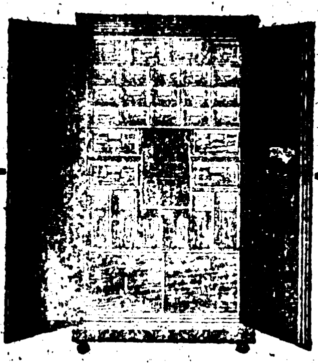

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Original Articles

AN EXAMINATION OF THE DUCTLESS GLANDS IN EIGHT CASES OF DEMENTIA PRÆCOX[1]

PRELIMINARY REPORT

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The following studies were prompted by the view that in dementia præcox we have to do with a state or states of autointoxication. While this view is not uniformly held, there is reason to believe, notwithstanding, that it best explains the clinical findings. This view, which has already been expressed by one of us in an earlier paper,[2] may be briefly summarized as follows: Because of the name, we frequently think of dementia præcox as a disease which is a dementia primarily and of which the dementia is the most prominent feature. However, the facts do not really justify such a conclusion. We need not enter into a discussion to show that dementia præcox is not in its early stage, at least, a dementia, nor need we adduce the numerous clinical facts upon which this conclusion depends. Disorders of memory so common in true dementia are distinctly not the initial features of dementia præcox. Instead we have frequently presented to us an account of hallucinations, hallucinations which are painful in character,—usually hallucinations of hearing, sometimes of the other special senses, sometimes hallucinations which are clearly somatic. Associated with these hallucinations we have delusions which consist of a mingling of hypochondriacal and persecutory ideas. These ideas, especially in hebephrenia and catatonia, are essentially unsystematized and fragmentary. We need not point out how in the beginning the memory is well preserved and how long this preservation may last. Indeed, it is only relatively late that cases of dementia præcox present changes in keeping with quantitative mental loss such as the failure of memory, failure to acquire new facts or to properly coördinate them, failure of proper emotional reaction and allied phenomena, but these features do not characterize the beginning of dementia præcox. The striking feature in the beginning of dementia præcox is not dementia; it is confusion. Regis, who was among the first to point out the importance of infections and intoxications in the development of insanity, and who aided largely in bringing psychiatry into touch with modern medical thought, expresses himself unequivocally to the effect that the affections classifiable under dementia præcox are cases of mental confusion. No less distinguished an alienist than Macpherson of Edinburgh, while he accepts dementia præcox, classifies dementia præcox under confusional insanity. When we recall the known rôle which infections and intoxications play in the production of delirium, confusion and stupor, it is certainly not going too far to infer that dementia præcox is due in all probability to a toxin or toxins; agents which probably call forth by their action upon the cortical neurones, hallucinations and delusions and later on, in given cases, bring about their destruction. Of course, in the absence of definite scientific knowledge, the view of the toxic origin of dementia præcox must be regarded as only tentative. However, features such as we have here outlined naturally suggest speculations as to the possible origin of the toxins. It is probable, if toxins really exist, that they are formed within the body. At least the uniformly negative clinical history with regard to infections and intoxications from without points overwhelmingly to such a conclusion. As to the source of such poison or poisons, we are, of course, as yet in the dark. That their production is in some way related to the one great factor of the neuropathy which is present in the mass of these cases, is extremely probable, for neuropathy in general terms means not only arrests and deviations affecting the skull, the limbs, the vascular apparatus and other structures, but it means especially a departure from the normal of the organism as a whole. That the ductless glands and other tissues, each of which contributes its share to the various fluids of the body, should also be involved in this imperfect and aberrant development, is extremely probable. Certainly it would seem that the conditions present in neuropathy are such as to favor diminished resistance on the one hand and the development of a toxic metabolism on the other.

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[1] Read before the American Neurological Association, May 30, 31, and June 1, 1912.

[2] "The Heboid-Paranoid Group (Dementia Præcox). Clinical Relations and Nature," *American Journal of Insanity*, Vol. LXII., No. 4, April, 1906.

The fact that dementia præcox begins in the years when developmental changes are greatest, the years of puberty and adolescence, is extremely suggestive; it is associated with a period of great expansion and revolutionary metamorphosis, and during which extraordinary demands are made upon the vitality of the organism. That the development,—the evolution,—of cases of dementia præcox is quite frequently delayed, incomplete or aberrant, every clinician, we think, will admit. How great a rôle the internal secretions play during the transformation and growth of the adolescent period, a moment's reflection will call to mind. That the glands are also closely inter-related is another fact of prime importance. This relationship is no longer a matter of theory and of speculation but must also be regarded as established. Sexual evolution is dependent, as we to-day know, not only upon changes in the ovaries or testes, but also upon the pituitary, the pineal, the thyroid and possibly other internal glands. We have reason to believe that the organism in dementia præcox is one which unfolds or evolves imperfectly and irregularly, and that at the time when this great change of adolescence takes place, the response on the part of the ductless glands is imperfect as well. Whether or not the physical signs in dementia præcox suggest an aberrant action of the internal secretions is of course open to question. The vagaries not infrequently observed in the one gland exposed to observation, namely the thyroid, as well as the facts of the circulation, especially of the surface and extremities, strongly suggest such a condition. Perhaps other symptoms might be mentioned. It certainly cannot be claimed that the idea of the existence of a toxicity in dementia præcox related to an imperfect development of the glands of internal secretion is inherently improbable. At any rate, some four years ago one of us (Dr. Dercum) determined to undertake the study of the glands of internal secretion in this affection. Accordingly a large number of cases were studied clinically in the insane department of the Philadelphia General Hospital. Of these eight subsequently came to autopsy. The autopsies and microscopical examinations were made by Dr. Ellis.

The clinical histories of these cases are not reproduced in detail but are merely briefly summarized. The results of the autopsies are also merely outlined, special attention being directed to the ductless glands.

CASE I. (Registered No. 7536.) M. H., age 28, white, Russian, was admitted on March 20, 1908, with the diagnosis of confusion. Later this was revised to dementia præcox By December 3, 1908, he had become excessively emaciated and bed-ridden. At this time slight resistance was offered by the extremities on extension but this became less with repetition of the movement. I regarded the case as one of hebephrenia with signs in the later stages suggesting very faintly catatonic symptoms. He died December 7, 1908, of tuberculosis.

Autopsy, December 9, 1908.

Pathological Diagnosis.—Ulcerative tuberculosis of right lung; chronic myocarditis; hyperemia of spleen; ulcerative tuberculosis of intestines; tuberculous pneumonia of left lung.

Thyroid Gland.—The thyroid gland shows no gross lesion. Microscopically, the acini show no departure from the normal. Colloid is abundant and quite homogeneous. Some masses contain a large clear space but no definite collection of small vacuoles around the border, only an indistinct outline of such at points. The lining cells of the acini are small, regular, and many show poor staining of the protoplasm with granulation. Connective tissue is not increased. Throughout are apparently new acini forming in the stroma, many of the smaller ones being largely filled by cells, there being in some no clear-cut peripheral layer, all being arranged irregularly in the space. A few of these contain a small mass of colloid in the center, with cells scattered through it. There are no papillary growths into the acini. Blood-vessels show no noteworthy change.

Hypophysis.—Eosinophile cells very numerous in posterior and middle thirds of anterior lobe, scanty in anterior one-third. Colloid is scanty. There are a few cysts in extreme anterior part of posterior lobe, where there are also scattered cells similar to those of the anterior lobe. Capillaries are not distended. Posterior lobe contains a very few hyalin masses.

Adrenals.—Left adrenal fairly firm, oval in outline, cortex yellowish pink and nodular; medulla brownish-red, softer than cortex. Weight 8.2 grammes.

Right adrenal: upper pole and anterior surface are firmly adherent to the liver. On section the liver tissue is seen to invade cortex. Weight 9.2 g.

Microscopically the adrenals are thin and show relatively little medulla. The cells of the zona glomerulosa stain fairly well; they contain but little fatty substance as shown by but few vacuoles. In some sections there is marked distension of the capillaries in this zone. The cells of the fasciculata also contain but little fat. Throughout the cortex are cells which do not react well to stains; the outlines are indistinct, the cytoplasm granular. The cells of the medulla are granular, the outlines indistinct; in many the cytoplasm is only a scanty reticulum. The nuclei react well to stains.

Thymus.—In the tissues of the anterior mediastinum are scattered remnants of thymus gland, consisting of islands of small round cells the nuclei of which stain intensely. Occasionally an eosinophile cell is seen. Hassall's corpuscles are numerous, but in all marked degenerative changes have occurred, converting them largely into granular débris. The concentric arrangement is, however, still quite conspicuous in many of them.

CASE 2. (Registered No. 7065.) A. D., white, age 24, Austrian, sailor, was admitted June 3, 1907, with the diagnosis of dementia præcox. He was in a state of catatonia; held his forearms or legs in fixed positions for long periods of time. Words said before him were repeated as an echo. He was noisy, refused to answer questions, was unable to give an account of himself, had a dazed expression.

Examined December 3, 1908, he was in bed without change of position. Slight resistance when the arms were extended; also some suggestion of automatism. When a limb was raised from the bed, it would be held up for a time and then allowed to sink slowly to the bed. Asked to show the tongue, the patient would open his mouth slowly, slowly protrude the tongue and then keep mouth and tongue in this position for some time. He was very dull and heavy. Death March 6, 1909, from tuberculosis.

Autopsy, March 8, 1909.

Pathological Diagnosis.—Ulcerative tuberculosis of left lung; miliary tuberculosis of right lung; atheroma of coronary arteries and aorta; chronic diffuse nephritis; congestion of liver; edema of brain.

Thyroid Gland.—The thyroid gland is small and pale in color, especially on section. Microscopically it shows abundant colloid, the masses of which are mainly smaller than the acini, leaving a peripheral space which in the larger acini is free; in a few there is occasionally a cell mixed with colloid. Many of the small masses of colloid contain large vacuoles, the larger masses very few large vacuoles but numerous small ones around the margin, although the latter are not conspicuous. The nuclei of the lining cells, which are adherent to the walls in complete rows, are well stained, cytoplasm is granular, in many cases fragmented, in most outlined with difficulty. In many small acini the epithelium shows proliferation, there being two rows part of way or they nearly fill the space, where colloid is lacking, as it is in many instances; in others they are scattered through the colloid. At points there is quite a decided increase in fibrous tissue, especially beneath the capsule, though in general this is not an important feature. Blood-vessels are essentially normal. Weight 16.1 g.

Hypophysis.—The hypophysis has a moderate-sized posterior lobe. Anterior lobe is red in color, quite firm. Whole organ appears normal. Microscopically there are numerous colloid cysts, some large, in posterior part of anterior lobe. There is extension for some distance of anterior lobe structure into the posterior lobe. At one site there are two large colloid cysts underneath the capsule of the posterior lobe at the furthest point from the anterior lobe. Protoplasm of the cells of the anterior lobe is in general granular and ragged, as those of the thyroid and parathyroid. Eosinophile cells are scanty except for moderate numbers in anterior and middle portions of anterior lobe. There are only small numbers of the small round cells in the gland. The capillaries in a broad zone beneath the capsule are dilated, elsewhere not. There is a very small amount of colloid in the anterior lobe; only here and there is an intraacinar globule. Posterior lobe contains only an occasional hyalin mass. Weight 0.7 g.

Adrenals.—Left adrenal shows near upper posterior border a small yellow elevated spherical body 0.3 cm. in diameter. Otherwise no gross points noteworthy. The organ is thin. Weight 5.8 g. Right adrenal no gross abnormalities. In the hilum is a small yellowish spheroidal nodule 0.4 cm. in diameter. Weight 6.1 g.

Microscopically the cells of the glomerulosa of the adrenals are indistinct as such, the outlines having completely disappeared. The cytoplasm is represented by loosely placed granular material which at points forms an indistinct network enclosing small spaces. The nuclei of the majority of these cells are normally placed; some are displaced inward from their peripheral location. They react strongly to basic stains and morphologically appear normal. The cells of the fasciculata are granular and the cytoplasm of some of them bordering or near the glomerulosa contains small well defined vacuoles. The nuclei react well to stains. The reticularis shows no noteworthy features except only about one third of the cells contain definite pigment granules. This zone extends deeply into the organ, the medulla being extremely narrow and containing reticular cells at many points through it. The vessels of the cortex are slightly if at all distended. At some points the glomerulosa, and to a lesser extent the fasciculata, show quite marked increase of connective tissue in the shape of bands running inward from the capsule, though only in occasional areas has it caused, or is accompanied by, advanced regressive changes in the parenchyma.

Essentially the entire medulla in sections from most of the blocks shows more or less increase in the connective tissue. This is specially prominent near the large veins but is not confined to this location. The cells possess a very poorly staining, granular cytoplasm which in most instances has an illy defined boundary; in some the nucleus is almost free of cytoplasm. The nuclei are small but generally well stained. The cells show no brownish coloration. Reticular cells are scattered through the medulla.

Parathyroids.—The parathyroids, two right and two left, show very deeply stained nuclei. The cytoplasm resembles that of the thyroid cells, granular if distinct, but as a rule very indistinct. The nuclei are connected, or rather separated, by a faint network rather than by cytoplasmic masses. Only occasionally is there seen a cell the cytoplasm of which takes the eosin stain especially. This may be due to the scanty cytoplasm of many of the cells, or at least this would explain the condition.

Carotid.—The right carotid body is long and narrow. The protoplasm of the cells is granular and stains indifferently. Occasionally there is seen a cell with moderately deep staining by eosin. Capillaries are not dilated. There is a trifle more fibrous tissue than is found in the average gland but this is not marked.

CASE 3. (Registered No. 6670.) R. C., age 36, white, admitted to the hospital October 29, 1906, with the diagnosis of dementia præcox. Had previously been a patient in the insane department for eight years. Was taken home by his parents in April, 1906, and readmitted in the fall as just stated. He was markedly confused and suffered from both auditory and visual hallucinations; silly, laughed without cause. At one time had persecutory ideas. He died March 24, 1909, from tuberculosis.

Autopsy, March 24, 1909.

Pathological Diagnosis.—Chronic caseous tuberculosis with cavity formation in both lungs; bilateral chronic adhesive pleuritis; atheroma of aorta; chronic diffuse nephritis; tuberculosis of spleen; chronic catarrhal gastritis; multiple tuberculous ulcers of intestines; tuberculous peritonitis; tuberculous mediastinal and mesenteric lymphadenitis; edema of brain.

Thyroid Gland.—The thyroid contains the usual amount of colloid which stains deeply and uniformly. There is generally a row of small vacuoles in the border of the mass, occasionally scattered through it. A large number contain one large vacuole. The connective tissue is little if any increased. There are a very few small papillary ingrowths in the acini. The lining cells of the acini are distinct and well stained. The vessel walls are normal. Weight 17.5 g.

Hypophysis.—The hypophysis is if anything slightly smaller than the usual. Microscopically eosinophile cells are numerous, especially in the peripheral portions; they stain deep brownish-red by eosin and bright red by eosin and methylene blue. There are only a few moderate sized colloid cysts in the posterior part of the anterior lobe. In one lateral part of the anterior lobe, with a narrow band of cells between it and the capsule, is a large triangular area that is largely fibrous tissue but which has numerous round or oval cells scattered through it in small spaces. Projections of this tissue extend into the surrounding gland at points, as though the process was extending and encroaching on the organ, the cells of the latter becoming attenuated and finally disappearing. The cells in the fibrous tissue are presumably the remains of the gland cells and in many instances are but little more than nuclei. Colloid in the anterior lobe is very scanty, only an occasional droplet. The posterior lobe contains only a few scattered hyaline masses and these are not clearly outlined; most are more like granular cells that are becoming hyaline. Weight 0.4 g.

Adrenals.—The adrenals shows no noteworthy points in their gross appearance. Microscopically the cytoplasmic boundaries are very distinct in practically all the cells of the three layers of the cortex. That of the cells in the glomerulosa takes the stains, especially eosin, very intensely, staining a brownish-red. The cytoplasm in all is granular, but only occasionally does a cell contain a few tiny vacuoles. The nuclei stain deeply. In the fasciculata the cytoplasm is not so deeply stained but is quite distinct. In only a few are there tiny vacuoles. The cells of the reticularis are less well stained; in numerous cells the outline is not perfect, the cytoplasm is very granular, and reacts feebly to stains. Only a small number are pigmented.

The cells of the medulla possess indistinct outlines. The cytoplasm is very granular, in many this portion of the cell being only a reticulum in which the nucleus is placed. None show the chromaffin staining. Scattered among them are occasional cells of the reticularis type. There is no noteworthy increase in connective tissue except at the line of junction of the cortex and medulla. Here is a distinct band which sends prolongations between the cells, especially the reticularis of the cortex, without actually displacing or replacing many of them, although a few have essentially disappeared Weights, left adrenal 5.1 g.; right 4.5 g.

Parathyroids.—The cells of the parathyroid stain well. A small number of eosinophiles are present, scattered throughout the glands. There is no colloid. The vessels are not dilated.

Carotid Bodies.—The carotid bodies are made up of several lobes. The cells are well stained and show no definite degenerative or other change. The vessels are numerous but small; they are not dilated. In sections stained by eosin and methylene blue, 5 to 10 per cent. of the cells possess a cytoplasm that reacts strongly to the eosin stain.

CASE 4. (Registered No. 6871.) J. B., age 27, white, admitted with the diagnosis of dementia præcox, March 26, 1907. When admitted was depressed and hallucinatory and at times excited. Later stuporous. June 15, 1907, presented marked catatonia with pronounced negativism. Finally became bedridden and died of tuberculosis, April 21, 1909.

Autopsy, April 21, 1909.

Pathological Diagnosis.—Cloudy swelling of heart; pleural effusion, left side; hydro-pneumothorax, left side; ulcerative pulmonary tuberculosis; chronic nephritis; congestion of liver; tuberculous ulcers of intestine; calculus of left kidney; edema of brain.

Thyroid Gland.—The thyroid presents unusually prominent interlobar septa, the interacinar tissue being also conspicuous in many locations. Colloid is present in usual amount. In most acini it shows small vacuoles at the border, in a very few large vacuoles. The lining cells of the acini are well stained. Small (developing?) acini in the stroma are not infrequent. Papillary ingrowths are seen in a few of the acini; all are of moderate height and in general are not conspicuous. Weight 11.5 g.

Hypophysis.—The cytoplasm of the cells is fairly well preserved and the nuclei react well to stains. Eosinophile cells are scanty except at points in the subcapsular zone and in the middle third of the anterior lobe; here they compose in some instances almost the entire alveolus. Small, deeply stained cells are exceedingly scanty, practically absent. There are a few large cysts in the posterior part of the anterior lobe; they contain cell débris rather than colloid. In the anterior lobe, just anterior to the middle, is a large cyst, the content being cell débris. In the posterior lobe and infundibulum are a few hyaline and granular bodies. Weight 0.78 g.

Adrenals.—The adrenals show no gross lesion. Microscopically the two organs are essentially the same except the right has a thicker medulla. There are an unusual number of accessory adrenals in and attached to the capsule. The cells of the glomerulosa are somewhat granular but in the main possess distinct outlines. They contain no vacuoles. The cells of the fasciculata as a rule contain no vacuoles; in some areas scattered cells contain one, occasionally two or three, large vacuoles which in instances occupy nearly all of the cytoplasm, even flattening the nucleus. These cells are quite granular. Many cells of the reticularis show numerous small vacuoles. Others stain deeply by eosin and contain scanty pigment. The cells of the medulla show decided degenerative changes. The cytoplasm is granular, fragmentary, vacuolated; in many instances there is little but the nucleus left. A few reticular cells are scattered among them. None of them stain as chromaffin cells. The vessels are normal. Weight, left 10.5 g.; right 10.5 g.

Parathyroids.—These are well stained. There is moderate fatty infiltration near the poles. A few eosinophile cells are present. They contain a few small globules of colloid-like material although it is slightly granular.

Carotid Body (*right*).—This is a globular, compact body of fairly large size. It is well lobed by connective tissue bands. The connective tissue is unusually abundant but the cells stain well. The vessels are not dilated. No eosinophiles are demonstrable.

CASE 5. (Registered No. 5820.) D. C., age 18, white, was admitted December 29, 1904, with the diagnosis of dementia præcox. Was markedly hallucinatory and confused, refused food, thought it contained poison; vague ideas about hypnotism and electricity; slow, silly, vacant. Not catatonic. Gradually became bedridden and died April 22, 1909, of tuberculosis.

Autopsy, April 23, 1909.

Pathological Diagnosis.—Ulcerative tuberculosis upper lobes both lungs; disseminated tuberculosis lower lobes both lungs; cloudy swelling of heart; chronic adhesive pleuritis, right side; amyloidosis of spleen, kidneys and liver; fatty infiltration of liver; chronic parenchymatous nephritis; tuberculous ulcers of intestine; edema of brain.

Thyroid Gland.—The thyroid is rather small, red in color and very firm. Microscopically the thyroid shows in many lobules a decided increase in connective tissue, the interacinar trabeculæ being thickened. This has narrowed the lumen of many of the acini, but they, or others, are still further changed in many instances by the presence between the lining cells and the wall of a homogeneous material staining in general much like colloid; at points there is a faint connective tissue stain. This material has elevated the cells and displaced them inward, thus narrowing the lumen, in some instances almost occluding it. In some the cells have also proliferated. Definite colloid is in the narrow lumen in some, in others there is only a collection of granular globules staining moderately like colloid. In many of the acini not thus affected the colloid does not fill them, although in numerous ones the lining cells are flattened as though by pressure; in some they have almost entirely disappeared. In some the mass of colloid is surrounded by a broad band of granular débris, this being most prominent where the cells are least conspicuous. The general appearance of the gland is that of a thyroid with considerably lessened colloid and epithelial cell constituents, although here and there are lobes relatively little changed. The blood-vessels show no definite changes. Weight 14.5 g.

Hypophysis.—The eosinophile cells are very numerous (at least eight tenths of the cells) in the anterior lobe and are very deeply stained. The small round cells are very few in number. Several large colloid cysts are between the anterior and posterior lobes and one large one within the posterior lobe; there are also extensions of anterior lobe cells into the posterior lobe. Small and large hyaline masses are scattered through the posterior lobe and infundibulum in large numbers. The colloid in the anterior lobe is scanty. Weight 0.9 g.

Adrenals.—The left adrenal is large. The external surface is studded by innumerable, slightly elevated yellowish markings, especially prominent near hilum. The right is very broad but thin; it shows no gross lesion. Microscopically the adrenals show in the cells of the glomerulosa numerous small vacuoles, making the cytoplasm a mere reticulum only. The fasciculata has undergone marked degenerative changes. Most of the cells have lost their outline and fused, giving the appearance of an almost solid mass for a considerable distance at many points. Some of this material has a hyaline appearance. The nuclei in such areas are small and irregular, or have entirely disappeared. Where the cells are still relatively normal they contain numerous small vacuoles. Some of the cells of the reticularis contain vacuoles, others stain quite deeply. But little pigment is present. Some of the reticular cells are scattered through the medulla. The medulla is narrow and many of the cells show degenerative changes, the cytoplasm being granular and fragmenting. Weight, left 12 g.; right 9.5 g.

Parathyroids.—There is one definite parathyroid and three other bodies, 3 to 4 mm. in diameter, on the inner and posterior surface of the right lobe of the thyroid; these are yellow in color and very firm.

The parathyroids show very extensive intercalation of adipose tissue. They contain a moderate number of eosinophile cells which, however, do not stain deeply. There are a few small collections of colloid in the glands.

Carotids.—The right carotid body is small and is made up of few lobules. It contains a few eosinophile cells which are apparently in the stroma.

CASE 6. (Registered No. 5779.) J. W., age 21, white, was admitted November 18, 1904, with the diagnosis of acute mania. This was later revised to dementia præcox. He was confused, silly, wandered about, thought people were after him; slow, laughed causelessly, indifferent, muttered, made grimaces. At times was catatonic. Finally became bedridden and died of tuberculosis, May 7, 1909.

Autopsy, May 8, 1909.

Pathological Diagnosis.—Vesicular emphysema of lungs, bilateral chronic adhesive pleuritis; chronic adhesive tuberculous peritonitis; chronic diffuse nephritis; fatty infiltration and cirrhosis of liver; tuberculous ulcers of stomach; patulous foramen ovale; fistulæ of left hip; multiple fistulæ of left inguinal region.

Thyroid.—The thyroid gland is very small. The lobes are about equal in size. The organ is fairly firm in consistency. Microscopically areas show a moderate increase in interstitial tissue. Masses of regularly staining colloid entirely filling acini are somewhat scattered in these areas and to a certain extent over the entire gland. Intervening are indistinctly outlined acini with no content or a hazily staining colloid. Some of the masses of colloid show a row of small vacuoles at the periphery, most do not. The lining cells of the acini as a rule appear small, some are distinctly flattened. The nuclei stain well as a rule. In the flattened cells they appear as oblong, very darkly stained, homogeneous bodies. This is especially true of the smaller intervening acini in the stroma (newer cells). Weight 8.5 g.

Hypophysis.—Eosinophile cells form one fourth to one third of the cells in the posterior and middle thirds of the organ; there are almost none of them in the anterior third. The cytoplasm of the chromophobe cells is granular and poorly stained. The vessels are moderately dilated. There is only an occasional mass of colloid in the posterior third of the organ. Cysts between the lobes are very few and have but scanty colloid content. At one place the anterior lobe structure extends for some distance into the posterior lobe. In the posterior lobe are fairly numerous hyaline masses. In one series of sections from about the middle of the gland there are near the infundibular projection two conglomerate masses containing ten or more rounded globules of hyaline material, each the size of those found separately as probably coming from one cell. There are also separate globules scattered through these sites. Weight 0.7 g.

Adrenals.—The left adrenal is soft but has no evident gross lesions; this is also true of the right organ. Microscopically, the cells of the glomerulosa are decidedly granular but in only a small number are there vacuoles and these are all extremely small. The cell outline is quite distinct in all but in a moderate number is not regular, due to slight fragmentation of the cytoplasm. The nuclei are well stained though some are partly obscured by granules. The cells of the fasciculata are extremely granular, some of them possessing an irregular outline. Some have no nucleus, being only a mass of large palely staining granules. There are practically no vacuoles in these cells. In the reticularis many cells have practically disappeared, there being only a few scattered ones intact. In place of these which have disappeared are only a few granules or else a collection of large vacuole-like areas resembling shadow red corpuscles. The few remaining cells are granular, but contain no vacuoles. Both organs are essentially the same. The cells of the medulla are fairly well preserved, though granulation is quite extensive; a few have irregular outlines. The nuclei are distinct. No chromaffin staining is shown. Weight, left 10.5 g.; right 8.5 g.

CASE 7. (Registered No. 7407.) W. W., white, age 22, was admitted December 20, 1907, much confused. Answers to questions much delayed; unable to account for his admission to hospital. Thinks people talk about and revile him. Hostile in his attitude; remains in one position for hours at a time. Finally became bedridden. Died of tuberculosis, May 19, 1909.

Autopsy, May 20, 1909.

Pathological Diagnosis.—Fatty infiltration of heart; bilateral chronic adhesive pleuritis; bilateral ulcerative pulmonary tuberculosis; chronic parenchymatous nephritis; congestion and fatty infiltration of liver; multiple tuberculous ulcers of intestines; patulous foramen ovale.

Thyroid.—The thyroid gland is large; the right lobe is 7 cm. long and 2 cm. in maximum thickness. The left lobe is 6.5 cm. long. The right lobe is quite soft, the left is more resistant. Microscopically the gland is very rich in colloid, the great majority of the acini being filled, only a few small ones in the stroma, as in many glands, being devoid of this material. It stains deeply by eosin. Only a few masses show small vacuoles in the border of the substance. The lining epithelium of the acini is well stained. These cells are low, as if moderately flattened; there is only one layer. The connective tissue of the gland is not increased. The gland is very rich in colloid; the great majority of the acini are filled, only a few small acini in the stroma, as in any gland, lacking this substance. The colloid stains deeply by eosin. Only a few small masses show vacuoles in the border. The lining cells of the acini are well stained. They are low, as if moderately flattened by pressure. There is only one layer. The stroma is not increased in amount. Weight 31 g.

Hypophysis.—The great majority of the cells in the posterior two thirds of the anterior lobe stain diffusely red by eosin; they are not occupied by distinct granules taking this dye. In many of the acini the cells are shrunken from the wall; a few are irregular in outline. The anterior one third contains very few eosinophile cells. In some sections a narrow zone of the anterior lobe for about one third of the circumference shows rather more fibrous tissue than does the remainder of the lobe. The cytoplasm of many of the cells shows degenerative changes with irregular boundaries. The vessels are dilated. There are occasional masses of colloid in the acini, especially in the posterior two thirds of the lobe, but they are not conspicuous.

There are a few moderate-sized cysts in the extreme posterior part of the lobe in some sections; they contain very little colloid. At other levels in the gland instead of cysts there is a long and narrow space running transversely the whole length between the two lobes. This is lined partly by cuboidal cells, the remainder of the surface being bare of distinctive covering. This space is partly filled by granular débris and desquamated cells, some of the latter staining fairly well, many being granular and some occupied largely by vacuoles, of which there are two to six in each cell. Some show a faint nucleus, in others that structure has disappeared. At one place this space has broken through the boundary line and extends for some distance into the posterior lobe. Here it has the same content as described, with the addition of an occasional fragment of partly degenerated posterior lobe tissue. The margin here is irregular and is clearly formed of posterior lobe substance.

In the posterior lobe are occasional hyaline bodies, but they are not conspicuous at any level. At a few points in this lobe are a few acini of anterior lobe tissue. In such areas are transitional cells indicating the probability that the anterior lobe cells change into the hyaline masses found in the posterior lobe.

Adrenals.—The adrenals show no gross lesion. Microscopically sections from some parts especially, but all to some extent, contain extensive areas in which the capillaries are markedly distended. This is particularly prominent in the zona glomerulosa but also is present in the fasciculata. In these areas the cells of the glomerulosa are not prominent, the distended vessels being most conspicuous. Throughout they are slightly granular. Many of the cells in the fasciculata react feebly to stains. Some of such cells are granular, some have almost entirely disappeared. Some contain large vacuoles which render them a mere framework; these cells, however, are not numerous. The reticularis may be described in practically the same words as was the fasciculata. Many cells of this type are scattered throughout the medulla of the organs, this feature being more prominent in one than in the other. The cells of the medulla are granular and react poorly to stains. The chromaffin reaction is not present.

Carotid Bodies.—The carotid glands are almost perfectly globular bodies. There are numerous relatively equal-sized lobes formed by heavy bands of connective tissue stroma. The cells are well stained; there are rather more of the smaller-sized cells than usual. There are no eosinophile cells. The carotid arteries show slight intimal thickening.

CASE 8. (Registered No. 8348.) I. H., age 25, black, was admitted with the diagnosis of dementia præcox, September 15, 1909. Was actively confused. Was brought in by the police patrol. Duration of the affection unknown. Sullen, at times refused to answer; at others answer unintelligible; gazed vacantly about at times. Violent and noisy, required restraint; at others listless, dull and stupid. Finally became bedridden and died of acute miliary tuberculosis.

Autopsy, October 22, 1909.

Pathological Diagnosis.—Atrophy of heart; pulmonary tuberculosis; tuberculosis of peritoneum and kidneys.

Thyroid.—The thyroid gland is bright red in color, cuts easily, the cut surface is lobulated. Sections show regular acini which are almost fully filled with colloid, the acini being unusually uniform in size. Much of the colloid stains indifferently by eosin, only the thick wrinkled areas staining deep red. The lining cells of the acini have practically disappeared as such, in most instances only the faint outline of cells in the space between the wall and the colloid being discernible; in some there is little more than the faint suggestion of cells. There are but few forming acini in the stroma of the gland which is not notably increased in amount. These recent acini contain the most distinct lining cells. The colloid of the organ is quite uniform with the exception of wrinkling, which is probably due to difficulty in cutting. There is only occasionally a vacuole at the border of the mass, in contrast to the conspicuous number of them in most organs in which the lining cells are prominent. The vessels of the gland show no definite changes. Weight 18.6 g.

Hypophysis.—Most of the cells of the anterior lobe stain indifferently; they are granular and some show moderate disintegration. In the posterior third of the anterior lobe are many eosinophile cells, in the remainder of the lobe only a small number. They stain well only by eosin and methylene blue, eosin and hematoxylin not bringing them out to advantage. There are very few small masses of colloid in the acini of the gland and none in the interval between the two lobes. In this area are not cysts, only a space of separation between the lobes in the form of a long, narrow, cyst-like area. In it there is no colloid, only some desquamated columnar or cuboidal cells. In the posterior lobe are moderately numerous hyaline bodies, nearly all of them small. There is no extension of anterior lobe structure into the posterior lobe. Weight 0.5 g.

Adrenals.—The left adrenal is firm, resistant, grayish-brown in color. The cortex is grayish, the medulla reddish-brown. Microscopically the cells of the glomerulosa are granular. A few are disintegrated, so that only small irregular portions of the cytoplasm remain. The cells contain no vacuoles. The fasciculata shows essentially the same condition except that more of the cells have disintegrated; no vacuoles are present. The reticular cells are granular and contain only a very small amount of pigment. The cells of the medulla are indifferently stained and granular. A few reticular cells are scattered through this zone. No chromaffin cells are to be noted. Weight, left 9.5 g.; right 6.6 g.

Parathyroids.—The parathyroids show extensive intercalation of adipose tissue, at least one third of the area of some being made up of this substance. The cells of the glands have very deeply stained nuclei, the cytoplasm not being so distinct. There is only occasionally an eosinophile cell, in the shape of a diffuse pinkish stain of the cytoplasm. The small vessels are markedly distended.

Carotid Bodies.—The carotid bodies are well lobulated and do not contain an excessive amount of stroma. The cells are in general well stained but some are granular. None of them contain chromaffin material. Eosinophiles are not present. There is no distension of vessels.

To summarize the changes in the ductless glands in the eight cases of dementia præcox they have been tabulated in each case and the findings grouped. These can be briefly stated as follows:

Thyroid Gland.—The variation in weight is considerable, the figures for the seven in which this was determined being 16.1, 17.5, 11.5, 14.5, 8.5, 31, and 18.6 g. From this it will be seen that only one was of the average weight,—about 33 g.—five ranged from slightly above to slightly below half the normal, and one was only one fourth the usual weight of the gland.

The colloid content microscopically can be regarded as essentially normal in all except three of the eight. In two of these the quantity is less, in the other it is less and also reacts indifferently to staining reagents. In four the epithelial cells lining the acini are lessened in number, poorly stained, or have irregular outlines due to disintegrative changes. In four there is increase of connective tissue, either uniformly or in scattered areas; in none of them is this change extensive. In two cases there are small papillary ingrowths into some of the acini. The blood-vessels show no noteworthy changes.

Hypophysis.—The weights in seven cases are 0.7, 0.4, 0.78, 0.9, 0.7, 0.7, and 0.5 g. Of these, all except the 0.4 and 0.9 are within the usual weight limits. Eosinophile cells in the anterior lobe are numerous in five, of moderate number in two, and scanty in one. Colloid, both in the acini and in cysts between the two lobes, is scanty in all eight cases. There is local increase of connective tissue in one gland. Degeneration of cells is extensive in two. Hyaline bodies in the posterior lobe are few in five, moderately numerous in two and many in one of the cases.

Adrenal Glands.—These vary considerably in weight, the figures (for the two) being 17.7, 11.9, 9.6, 19.6, 21.5, 19, 12.5 and 16.1 g. Counting the usual weight as 6 g. each, this would make five greatly in excess, two about normal and one decidedly below normal.

Seven of the eight show but few or no vacuoles (fat) in the cells of the glomerulosa and fasciculata. In three cases each, but not the same three, the cells of the glomerulosa, the fasciculata, and the reticularis show degenerative changes in the shape of very granular cytoplasm with cell outlines indistinct or roughened by partial disintegration. In two the capillaries of the glomerulosa are distended. In only two cases do the cells of the reticularis contain pigment, and then only in small quantities. In the medulla no chromaffin cells are demonstrable; this would be precluded in seven of the cases because of the long time after death the tissues were secured, but the same is true of the eighth, which was autopsied four hours after death. In six of the cases the cells of the medulla are excessively granular and have illy defined outlines or are fragmented. There is some increase of connective tissue in the medulla of two cases and in the glomerulosa and fasciculata of one of the two.

Parathyroid Glands.—These were studied in five cases. Two show extensive fatty infiltration. The eosinophile cells vary from a few to a moderate number. In two there are small colloid collections.

In interpreting these changes in the ductless glands, two points must be borne in mind. (1) The time intervening between death and the fixation of tissues. In the seven cases in which the time of death and autopsy are recorded the period between the two was 32, 60, 4, 15, 23, 13, and 30 hours. With the exception of the adrenal medulla, the tissues of the second case show the least changes. Opposed to the view that the recorded changes may be largely postmortem is the fact that a case of epilepsy, autopsied fourteen hours after death, shows in general less extensive departures from the normal than do those of similar periods in the præcox series. (2) All eight cases of dementia præcox had tuberculosis, seven of them advanced ulceration of the lungs, one extensive tuberculous peritonitis and multiple fistulæ of the hip and abdominal wall. This is in itself an interesting point in the pathology of dementia præcox, but it complicates the picture by furnishing a possible cause for some of the regressive changes described.

One of the most notable points in the ductless gland findings is the underweight of the thyroid in seven of the eight cases. In addition three of them showed abnormalities in the colloid, quantitative or qualitative, and four decided regressive changes in the acinar epithelial cells. The parathyroid findings cannot be regarded as of significance. This applies also to the carotid and thymus.

The most constant adrenal picture is the small amount of fat in the cells of the cortex, especially those of the fasciculata. If this is to be regarded as indicative of functional change, it indicates lessened activity. In the hypophyses there is less colloid than is usually found in a series of these glands, but we know so little regarding the morphologic attributes of function in this body that this, as well as the number of eosinophile cells, can hardly be regarded as pathologic.

The condition of other organs, as the presence of chronic nephritis in most of the cases, can probably be safely attributed to the tuberculosis.

Our results are without question difficult of interpretation, but no more so than we anticipated. Meager as they at first sight seem, they would appear to be still further invalidated by the fact of death from tuberculosis. Are the changes in the glands noted by us a result of the tuberculosis or are they perhaps to be interpreted in accordance with another view that seems to us more probable? As just stated, of the seven thyroid glands that were weighed, all were markedly below weight except one; five of them weighed less than half of the normal thyroid and one only one fourth as much. Again we must recall that the adrenals also varied decidedly in weight from the normal; in five of the cases, as just stated, the weight was greatly in excess; sometimes from one and a half to almost double the normal weight. In one the weight was markedly below and in two only did it approximate the normal. In regard to the hypophysis our knowledge is not such as to enable us to speak definitely with regard to the changes found. In certain of the cases pathological changes appear to be present, though we could not satisfy our minds definitely with regard to this.

Without attempting an interpretation of the histological conditions—a matter of extreme difficulty in the present state of our knowledge—we are at least justified in the conclusion that in our cases there was in all probability a disturbance of what Sajous has called the "adrenal system," *i. e.*, of the chain made up of the pituitary, the thyroid and the adrenals. Especially was change noted—*e. g.*, striking departures in weight—in the thyroid and adrenals. Now Sajous has pointed out that in tuberculosis there is an inadequacy of this adrenal system and the thought naturally suggests itself that these eight patients suffered from dementia præcox for the same reason that they subsequently suffered from tuberculosis; that is, because of an inadequacy or abnormality of their adrenal systems. It is rather a remarkable fact that the almost universal cause of death in dementia præcox is tuberculosis and if the feebleness of resistance to the tubercle bacillus is due to a fault of the adrenal system, we have reason to infer that this fault preëxisted and that it is one of the factors in the makeup,—the morphology—of dementia præcox. The conclusion is, of course, not justified that an abnormality of the adrenal system is the cause of the mental symptoms of dementia præcox, but our findings are at least in keeping with the inference that anomalies of the ductless glands exist in dementia præcox. The relation between such anomalies and the mental symptoms must remain an open question but that the facts are most suggestive must be admitted and for this reason we venture to present our material in the form of a preliminary communication.

SEGMENTAL DISTRIBUTION OF SPINAL ROOT NUCLEUS OF THE TRIGEMINAL NERVE[1]

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For the *spinal nerves* it is believed by many that:

1. Tactile and pressure sensations are conducted through the posterior roots, along the posterior columns of the spinal cord to the *nuclei gracilis* and *cuneatus* of the same side. Thence the fibers form the internal arcuate bundles, decussate and enter the lemniscus of the opposite side.

2. Painful and thermic sensations after entering the cord through the posterior root travel through the posterior horn of gray substance to a column of cells at the base of the posterior horn. New axones arising from these cells cross the median line through the anterior commissure and ascend in the antero-lateral tract of the cord (associated with Gowers' tract).

3. The skin areas corresponding to each spinal segment are now fairly well outlined; while the areas corresponding to each peripheral nerve are still more clearly known. It is also well known that no constant relationship obtains between the two, since the area corresponding to any spinal segment may include parts of several peripheral nerve areas. The areas corresponding to spinal segments take the form of bands, like zebra stripes. In the limbs these zones are in the adult longitudinally distorted from the simpler bands of the embryonal limb-buds.

Passing from the trunk to the head, the interesting question is now suggested: What relation obtains between the segments of the nuclei of the *trigeminal nerves* and the skin areas of the face supplied by them?

There is much reason to believe that the trigeminal "spinal root" and nucleus have to do only, or chiefly, with temperature and pain perception. Müller (1) described a case in which a syphilitic lesion destroyed the "spinal root," and the only consequence was loss of pain and temperature perception in the face. In Hun's patient (2) a gross lesion wiped out the "spinal root" and its nucleus, with the result that pain and temperature anesthesia without loss of tactile sense occurred on the same side of the face as the lesion. In this patient the bulbar continuation of the antero-lateral tract (Gowers') was destroyed; thermanesthesia and analgesia (3) of the opposite side of trunk and limbs resulting.

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[1] From the Department of Neurology and Laboratory of Neuropathology, University of Pennsylvania. Read before the Philadelphia Neurological Society, November 24, 1911.

A number of writers have recently maintained that the proximal end of the nucleus of the "spinal root" receives the pain and temperature fibers of the whole mandibular branch of the trigeminus; the middle portion of the nucleus, the fibers coming from the maxillary branch; while the caudad end of the nucleus is the destination of the fibers bearing painful and thermic sensations from the ophthalmic branch of the nerve. Thus Müller interpreted the case above referred to, as did Spiller (4), a syringomyelic case exhibited before the Philadelphia Neurological Society.

The careful study by Spiller of the course and destination of the fibers of the three branches of the fifth nerve (6) led him to conclude that the bundles composing each branch remain distinct certainly through the Gasserian ganglion. As to their ultimate passage through the "spinal root" and their termination in its nucleus he feels that the arrangement just referred to must be inferred.

The two patients whose symptoms I am about to describe showed sensory disturbances of the face which could not be thus explained; but, on the other hand, strongly suggest a complete analogy of segmental distribution between the *trigemini* and the spinal nerves, so far as pain and temperature conduction is concerned.

Elizabeth E.,[2] a very alert, intelligent and willing subject. Tactile and pressure perception normal over entire body. Pain and temperature perception normal in lower extremities, absent in trunk, except lower abdomen, absent in upper limbs, neck, scalp and parts of the face. On the face pain was felt on the left side anterior to line *4* (see Fig. 1); on the right face anterior to line *3*. Cold was perceived on the left only in front of line *4*, but several months later this area had shrunken so as to be circumscribed within line *2*. On the right cold was felt at the early examinations within line *3*; later,—line *1*. Hot bodies were felt regularly within slightly narrower areas. The patient was examined repeatedly through four months. Her spinal cord at autopsy showed a syringomyelic cavity in each posterior horn, running from end to end, virtually dividing the structure into two

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[2] The two patients here described were in the Philadelphia Hospital. For the opportunity of studying the former I am indebted to Drs. Burr and Lloyd; for the other patient, to Dr. Charles Potts.

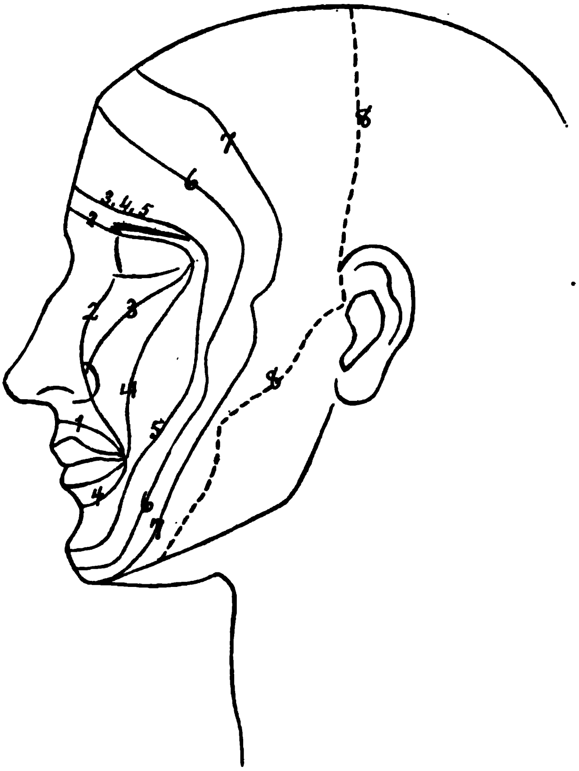

FIG. 1. Temperature and Pain Sensation in Eliz. E— and Chas. B—. *Chas. B—*. *8*, right side: Pain felt in front of this line; *7*, right side: Cold felt in front of this line; *6*, left side: Pain felt in front of this line; *5*, left side: Cold felt in front of this line. *Eliz. E—*. *4*, left side: Cold felt (early) in front of this line; pain felt in front of this line; *3*, right side: Cold felt (early) in front of this line; pain felt in front of this line; *2*, left side: Cold felt (late) in front of this line; *1*, right side: Cold felt (late) in front of this line. *Heat* was felt over slightly narrower zone than cold. *Touch* and *pressure* unaffected. (To facilitate comparison, right and left sides are both drawn upon the one diagram.)

columns, the smaller being composed chiefly of the posterior white columns. The cavities extended into the medulla oblongata, through the gelatinous substance of Rolando almost to the lower limit of the pons. The cavity on the right side extended slightly further cephalad than that on the left. This explains the smaller areas of preserved temperature and pain perception on the right side.

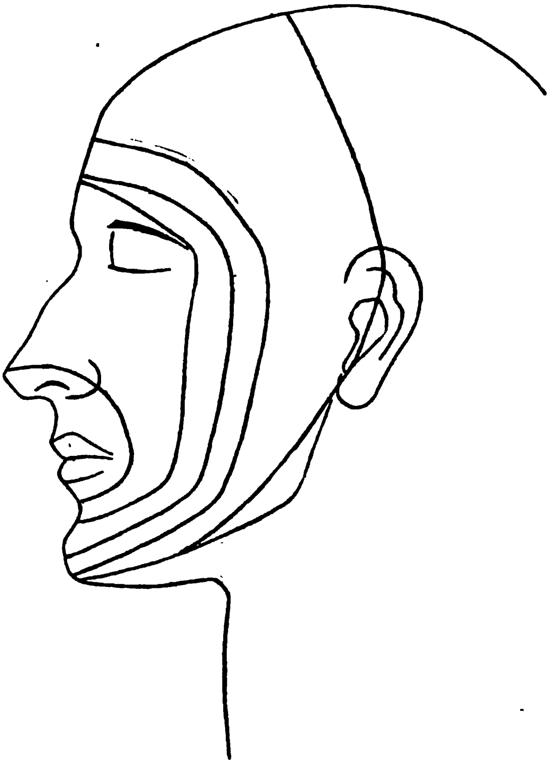

FIG. 2. Kutner and Kramer. Segmentales Fortschreiten der Sensibilitäts-storung am Kopfe. (Lewandowsky, Handb. der Neurologie, Vol. I, p. 787.) See also Schlesinger, Rindfleisch and v. Solder in H. Haenel's article. (Ib., Vol. II, p. 607.)

Stained sections from the lower bulbar region show that each cavity starts dorsally from the bottom of the median sulcus, extends laterally and somewhat ventrally to terminate near the periphery of the section. On the right side the cavity is bridged across by normal structures. At the level of the upper quarter of the olives the cavities extend on each side from the nucleus of ninth and tenth nerves ventrolaterally ventral to and parallel with the intra-bulbar fibers of those nerves to within a short distance of the periphery of the section. The cavities here are more interrupted by bridges of normal tissue. In sections taken from this block a little nearer the junction of pons and medulla oblongata the cavity on the left side has disappeared. In all sections the spinal tract and its nucleus are normal. The cavities extend in such a way as to affect them probably by cutting off their central connections (see Fig. 5). Wallenburg (5) in discussing the central fibers of this nucleus tells of a degenerated tract secondary to lesions of the upper cervical substantia gelatinosa which passed ventral to the twelfth nucleus, decussated and passed upward and somewhat laterally within the formatio reticularis (3). Inasmuch as the cavities in our patient extend ventral to the "spinal roots" of the trigemini and their nuclei, and cut those structures off from the formatio reticularis, it seems certain that the only pathway between the nuclei and the lemnisci is severed. This suffices to account for the sensory impairment in the patient.

The second patient, Charles B., showed no defect in tactile perception. Pain and temperature were perceived above the abdomen in only a few spots, and were not perceived at all on the neck and scalp. But on the right face anterior to line *8* (Fig. 1) pain was felt; while on the left, pain was felt only anterior to line *6*. Distinctions of temperature were correctly made on the right anterior to line *7*; on the left anterior to line *5*. As in the other patient, hot bodies were felt over a slightly narrower area than cold bodies.

Mucous membranes in Elizabeth E.: Corneæ and conjunctivæ very faulty temperature perception; left more often correct than right. Pain was perceived in these membranes poorly; here again the left side showed better perceptive power than the right.

In this woman the oral membranes distinguished painful stimuli and extremes of temperature, but towards the last these perceptions were limited to the tongue and areas near the front of the cavity. The same was true of the nasal membranes, though in them no tests were made of the deep portions.

In Charles B. pain and temperature perceptions were well preserved on cornea and conjunctiva on the right side; but were faulty on the left. In the oral cavity perception of both forms of stimuli was well preserved near the front and on the tongue. Farther back in the mouth, particularly on the cheeks, the various forms of stimuli were confused.

Lewandowsky's "Handbuch der Neurologie" gives diagrams of observations of Kutner and Kramer, and shows the combined results of examinations of the trigeminal sensory areas made by Schlesinger and others (Fig. 2).

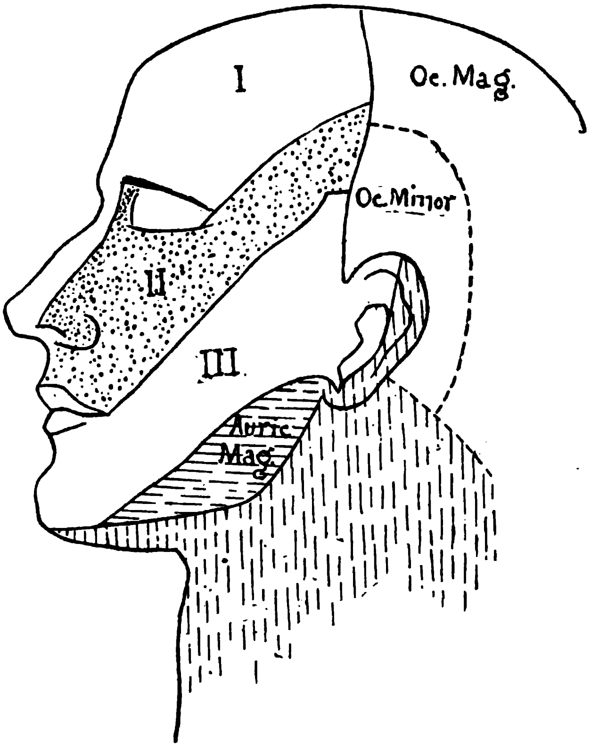

FIG. 3. Sensory skin areas supplied by the three peripheral branches of the V. nerve. After Bing: Gehirn u. Rückenmarks Diagnostik.

The skin areas supplied by the three branches of the fifth nerve are represented in Fig. 3. It is evident that the areas of thermanesthesia and analgesia in our two patients do not conform to the areas to which the peripheral branches are distributed (7). If the fibers of the three branches remain distinct as three separate bundles through the Gasserian ganglion and "spinal root," and terminate in three distinct levels of the "spinal root" nucleus, then no lesion can be imagined which could produce the sensory disturbance here pictured. It is probable that a reassembling of the fibers occurs before they reach the nucleus.

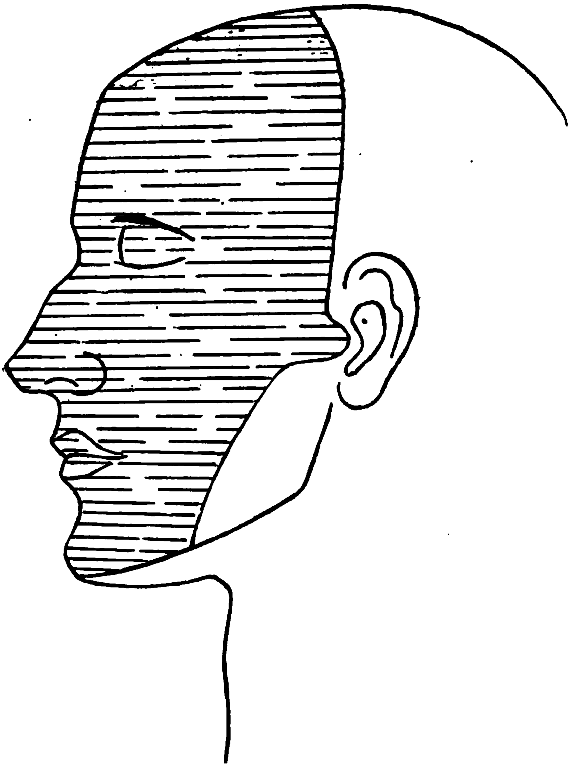

Fig. 4. Average trigeminal sensory area. Cushing. (Howell, Textbook on Physiology, 1909.)

In order to explain the findings in the two patients herein presented I suggest the following as a tentative hypothesis, awaiting confirmation from the study of other cases.

The caudad end of the "spinal root" nucleus receives pain and temperature fibers from a band of skin just anterior to the line shown in Fig. 4, passing from the vertex down to the meatus of the ear, thence to the chin (line *8* in Fig. 1). Some of these fibers come through the first, some through the second, and others through the third, of the peripheral branches of the trigeminal nerve.

Each level of the nucleus (passing cephalad) receives pain and temperature fibers from a concentric band of skin nearer the mouth. Finally the cephalad end of the nucleus receives pain and temperature fibers from the lips and perhaps the tip of the nose.

For the mucous membranes some similar arrangement may exist. Examination of these two patients, however, does not warrant more precise statement.

If a syringomyelic cavity commence in the base of the posterior horn low down in the spinal cord and gradually advance toward the medulla oblongata, it would cut off first the cells already mentioned at the base of the posterior horn which are concerned with thermic and painful sensations. As it reached the upper cervical region in the substantia gelatinosa it would destroy the cells to which these forms of sensation are carried

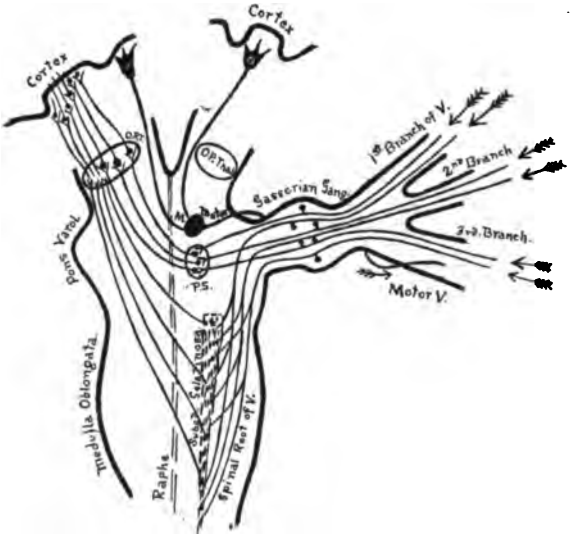

FIG. 5. Schema of fibers and nuclei of trigeminus. Modified from Bing. Tactile and pressure stimuli pass to principal sensory nucleus (*PS*) from all three branches Pain and temperature stimuli reach each level of "spinal root" nucleus through all three branches. Cavity in Eliz. E— cut off, central fibers running from substantia gelatinosa toward optic thalamus; cavity extended from caudad point up nearly to head of this nucleus.

from the two *occipitales* and the *auricularis major* nerves. The next step would involve the lower point of the *nucleus tractus spinalis trigemini*. Thus the sensory disturbance, which had crept up the trunk and neck, would advance upon the scalp and finally involve the forehead and face.

The forms taken by the zones shown in Fig. 1 are better understood if referred to the heads of the lower vertebrates, such as serpents and frogs, in which the somatic axis from snout to tail is parallel with the cerebrospinal axis. The head in these forms is less differentiated from the other (somatic) segments, so that it is not surprising that a segmental distribution of sensory nerves should be found for the head analogous with that found in the trunk. In these animals the final band of skin, corresponding to the most cephalad point of the long temperature-pain nucleus, is around the mouth.

It would thus appear that the trigeminal " spinal root " nucleus may be but a continuation of the pain-temperature nucleus of the spinal nerves.

An apparent difference would then seem to exist between the tactile-pressure arrangement of the spinal nerves and that of the trigemini in that for the spinal segments tactile-pressure fibers are distributed to the same areas to which the pain-temperature set are distributed, while for the trigemini no segmental arrangement of tactile-pressure fibers has been noted. But it must be observed that the skin area corresponding to a given spinal segment has been mapped out by examining the peripheral results of damage to that segment. Such a lesion may affect indeed the nucleus (in the base of the posterior horn) of the temperature-pain fibers; but it affects no *nucleus* of the tactile-pressure mechanism, but only the *bundle of fibers* entering the cord at that level which conduct tactile-pressure impulses. This shows merely that the fibers for all forms of sensation from a particular skin area enter the cord together, those for temperature and pain running at once to a nearby nucleus (in base of posterior horn), while those for touch and pressure run on upward in the posterior columns to the gracile and cuneate nuclei. Later observations may show that the different levels of the gracile and cuneate nuclei are appropriately connected with successive skin areas, corresponding to those of the spinal segments at which the tactile and pressure fibers enter. In the case of the trigemini the tactile-pressure bundle of each nerve is so compact, and the principal nucleus to which it extends is so nearly globular, that any subdivision of either would be difficult to demonstrate.

Therefore it can only be said that for the nuclei of the trunk and head that have to do with touch and pressure perception no segmental arrangement is known. For temperature-pain perception, if these two cases have been properly interpreted, a long nucleus extends on each side from the lower border of the pons down to the end of the spinal cord, related to the substantia gelatinosa and base of the posterior horn, and subdivided segmentally so that each level receives the fibers of a corresponding band of skin. The fibers from any one skin-band whether of head or trunk take the nearest convenient peripheral nerve route, and so may be found in several peripheral nerves; but they ultimately come together again at the proper point in the temperature-pain nucleus.

Why these two forms of sensation should be thus differently transmitted, and why the cells that have to do with temperature-pain perception should be stretched out longitudinally while the touch-pressure groups are so condensed, is another and difficult problem.

Conclusions

1. It is probable that *touch and pressure* sensations are conducted to the Gasserian ganglion, pass to new axones, enter the sensory root and go directly into the chief trigeminal nucleus. Thence new axones conduct them to higher levels, across the raphe and into the lemniscus. And that

2. Pain and temperature sensations pass from the ganglion, also along secondary axones, go through the sensory root down within the "spinal root" to the nucleus of that root. Thence new axones pass cephalad within the formatio reticularis, decussate and finally reach the lemniscus.

3. The two cases here presented suggest that the facial area connected with the caudad point of the "spinal root" nucleus is a band lying along line *8* (Fig. 1), and that each higher level of the nucleus is connected with a band of skin roughly concentric with the first, but nearer the mouth. Finally a zone of skin around the mouth and nostrils is connected with the cephalad end of the nucleus. The fibers extending from any skin zone to

the corresponding point in the nucleus may pass through all three peripheral branches of the nerve.

1. Müller. Deutsch Zeitsch. f. Nervenk., XXXI, 5 and 6.
2. H. Hun and Van Gieson. N. Y. Med. Jour., LXV, p. 513.
3. A patient of Spiller (Trans. Phil. Neurolog. Soc., Oct. 22, 1909) showed—right trunk and side of head: thermanesthesia with analgesia. Left face: trigeminal tactile anesthesia, nuclear paralysis of V. nerve (motor) of left side. Spiller accounted for symptoms by inferring a lesion in left *tegmentum pontis* which destroyed the antero-lateral (Gowers) bundle with its temperature-pain fibers from right trunk and limbs; destroyed also the recently decussated central fibers from the "spinal root" nucleus of right V. nerve; also destroyed the principal nucleus (tactile-pressure) of left V. nerve with its nearby motor nucleus. (Fig. 5 will make location of lesion clear.)
4. Spiller. See report of case, Jour. Nerv. and Ment. Dis., Vol. 38, p. 553.
5. Wallenburg. Anat. auz Jena, Bd. XII, s. 95–110. See Barker, "The Nervous System," 1899, p. 646.
6. Spiller. See Review of Neurology and Psychiatry, Vol. VIII, 1910.
7. Bing (Gehirn u. Rückenmarks Diagnostik, under "The Trigeminus") says: "In affections of the most distal part of the substantia gelatinosa in the medulla there follow disturbances of sensation in the frontal region, etc. Thus nuclear trigeminal anesthesias show localizing signs distinguishing them from anesthesias produced by peripheral nerve injuries, just as is true with spinal nerves."

THEORETICAL CONSIDERATIONS OF THE FUNCTION OF THE NODE OF RANVIER

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Insufficient notice seems to have been taken up to the present time of the peculiar histological structure of the nodes of Ranvier. Let us briefly review their interesting features. The following diagram, adapted from Ramon y Cajal,[1] represents our present knowledge of the minute structure of these nodes.

The axis cylinder is represented by *A*. At *C* the axis cylinder first expands and then undergoes a contraction at the node *E*. *D* is the cement-like substance surrounding the entire node about the axis-cylinder, and interposed between the successive sections of the myelin sheaths at each node.

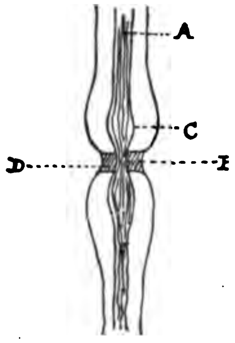

FIG. 1.

It is known that this cement substance is pervious to fluids, for our staining media enter here. This is evidenced by the fact that the staining of the nerve fiber begins at this point and travels inward. The staining is also much more intense here. It is supposed, in consequence, that the node offers the portal of entrance for the nutritive circulating lymph.[2]

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[1] Histologie du Syst. Nerv.

[2] E. A. Schaefer, Microscopic Anatomy in Quain's Anatomy, 1912.

If it is granted that the nerve impulse is electrical in character, then must it be subservient to the laws governing this force. Now, the electrical density of a current on a surface varies inversely as the superficial area of the surface, becoming infinitely great at a point. The smaller, therefore, the cross section of the axis cylinder at the node, the greater density there is of the nerve current at that point. Therefore, the sudden contraction from the bulbous expansion of the axis cylinder, determining a diminished capacity for the conveyance of an electrical impulse at the point, gives a greater density of the current at the node and hence a greater tension.

Since there is fluid egress and ingress at this very point, and since fluids are good electrical conductors, especially slightly saline ones, there needs be but a sufficient increase of tension of the nerve impulse at the node to determine its escape via the fluid to a point of less tension or potential. This point may be furnished by some node in a contiguous nerve fiber through which a current of very slight potential may be passing at the time; and there will be a flow of current determined to this adjacent fiber. Thus there will be constantly in any nerve trunk a continuous give and take—a balance—between the currents in the various fibers of that nerve. When the stimulus applied to any one fiber is too great for that fiber to carry, the excess will affect the surrounding fibers, through the nodes of Ranvier, and more than one end organ or one central ganglion cell, as the case may be, will be affected.

The application of these theoretical considerations may not be without interest, and may serve to explain the various "Verlegenheitsausdrücke" of which we have made so great use, such as "habit pain." Let us take, for instance, the pain suffered in the affection, trigeminal neuralgia. If this pain were actually produced at any one peripheral point of the face, then a section of the nerve leading thence to the central ganglion ought reasonably to cause the instant and complete cessation of the pain. This is true only for a limited time, after which the pain recommences. A higher section is then made, another branch severed, and again for a time only is there relief. And why? Because the terminal fibers of the three branches of the trigeminal anastomose. These anastomoses are never end to end, but lateral. As the excessive nerve current from the diseased periphery is cut off from the original path, it works its way through the nodes of Ranvier to the path which finally does conduct it to its central nucleus. And the reason for the reference of the pain to the original site, in spite of the block interposed through section, may be explained as follows, with the aid of the accompanying schematic diagram.

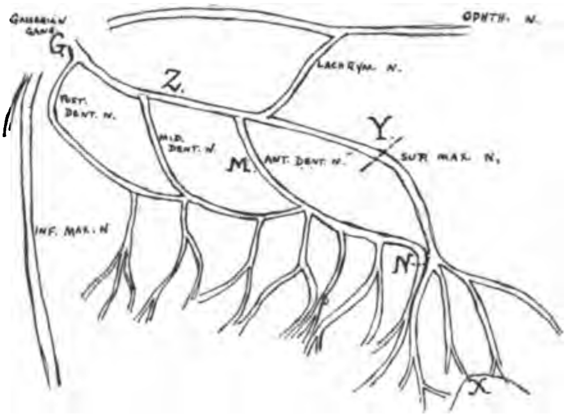


FIG. 2.

The site of original peripheral irritation is at *X* and the path of conduction of the stimulus is *XYZ*. At *Y*, section of the nerve is then carried out. The stimulus will then eventually find its way, presumably via the nodes of Ranvier, at *N*, to a nerve element which will conduct it towards the ganglion cell, *G*. But here all branches of the trigeminal again come together. The excessive current carried by the path *NMZ* is of higher potential than that which is carried from *Y* to *Z* on account of the section of the latter, causing a lack of impulses along it, and therefore a large part of the excessive current is again transferred to its original path—the central continuation of *YZ*, with the result of a final effect upon the sensory ganglion cell which was originally the one disturbed; hence the central reference to the original peripheral site of irritation. At the same time, the path *NMZ* is partially affected by the increased current it carries, its neurones are disturbed and the central reference of peripheral irritation is increased in area. Then comes section at a higher level to mitigate this increased pain, with similar results. Finally, the sensory portion of the Gasserian ganglion is severed and relief is obtained.

In a like manner may be explained the paths taken by the painful impulses, in locomotor ataxia. The pain arises in an area, the nerves of which can hardly conduct impressions through the extensive posterior sclerosis, but by traveling along higher paths than they originally traversed in the lumbar plexus, by means of the nodes of Ranvier, until their impulses reach the posterior roots at a level *above* the sclerotic areas, they enter the cord. Here again they may be re-transferred to the paths from which they were originally cut off by the sclerosis, on account of the respective differences in potential; and the reference of the pain to the original points of the periphery is again made possible. But the higher paths of the lumbar plexus conducting the increased impulses are partially affected by this increased work, and therefore some of the pain is referred to higher peripheral areas than before. This is frequently seen clinically. The examples thus far quoted are of afferent character.

It would be more difficult to advance a condition in which efferent impulses support this function of the nodes of Ranvier; for most motor activity originates with the will, and who can say when the impulse to perform a certain act is greater than is necessary to stimulate the muscles alone necessary to accomplish that act? Perhaps in the case of disseminated sclerosis we can find such excessive originating impulses. For the direct path to the muscles being sclerosed, an intensified impulse automatically (?) arises to overcome the nerve block. This increased impulse travels on other than the blocked paths, by means of the nodes of Ranvier, to the nerve ends in the vicinity of the desired muscles, and only slightly to these muscles themselves. The result is an activity of many more muscles than necessary to perform the required motion, and an oscillation occurs between limits on either side of the desired motion. Thus is produced the so-called intention tremor.

The application of this theory to many more clinically observed facts, for instance, the misreference of pain arising in the abdominal viscera to various definite zones on the surface of the body[3] will, I believe, throw much light upon their origin, and further, perhaps, tend to clear up the entities of which they are a part.

[3] Head, Brain, 1893 and 1901.

A NEW ESTHESIOMETER

By Dr. Siegmund Auerbach

FRANKFORT ON MAIN, GERMANY

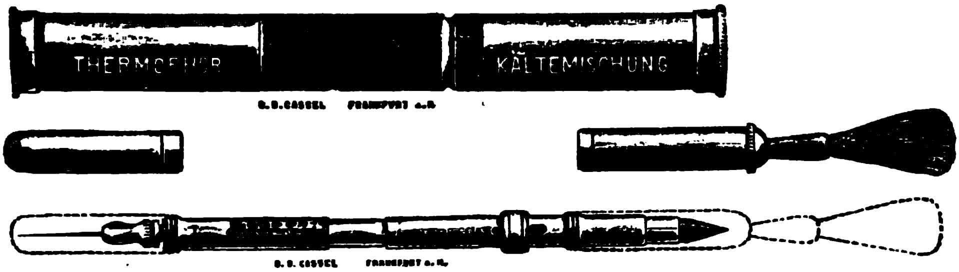
In the *Münchner medizinische Wochenschrift,* in 1907, I presented a brief description of a pocket esthesiometer, which can be utilized in the examination of patients suffering from nervous and mental disease.

Since that time increasing experience has afforded me the opportunity for improving upon this instrument, and I now desire to call the attention of neurologists to it in the perfected form which I have finally elaborated.

While it is by no means indispensable, I do believe that it is capable of filling a want in the armamentarium of the neurologist who often has to make a series of sensory examinations in a relatively short time. It offers the possibility of testing all the qualities of sensation of the skin, excepting the faculty of perceiving both points of a compass, at different intervals, and also excepting electrocutaneous sensibility, which, however, do not often concern us in practice.

The advantages of an esthesiometer are that it occupies only a very small space, and may be easily carried in the pocket, and with it one can work quickly, and yet very exactly. I consider it a special advantage to be able to trace immediately the limits of sensation, and even to have one hand free during the determination of the sensibility to contact, pressure and pain. Both hands are in use in the delineation of the limits of sensibility to temperature.

The instrument [which is manufactured by Kny, Scherer & Company and costs seven dollars] required many experiments and frequent alterations before it acquired its present form. It now consists of two parts. One of these (see Fig. 1) is slender, shaped like a penholder and covered at both ends with caps which are removable by simply pulling them off. The camel's hair brush used for testing tactile sensibility may be placed at the end of one of these caps. Inside of one cap is the needle for testing pain sensibility. This needle may be heated to redness before each examination without blunting. The other cap encloses a dermograph. Between this and the needle lies a spring which may be graduated to three different degrees of strength by means of weights. A turn to the left loosens the mechanism, enabling one to test the pressure sense by using either the dermograph, or the cap which covers the needle, and then compressing the spring. When for this purpose the needle is used the gradation of irritation to pain may be estimated by compressing the spring, just as with Aly's instrument. With this part of the esthesiometer tactile sensibility as well as that of pain and pressure may be tested, while simultaneously tracing the obtained limits.



FIGS. 1 AND 2.

The other part of the instrument is broader and serves to examine the sense of temperature. It has three divisions, namely two hollow metallic cylinders, separated by a solid rubber cylinder, which serves both as handle and insulator (see Fig. 2). The metallic cylinder which lies nearer the corrugation in the rubber handle is filled with sodium acetate, like a thermaphore. This salt when melted over a spirit lamp quickly communicates its heat to the surrounding parts, its re-crystallizing properties making it possible to use it a number of times without renewal. This part of the instrument is used to test sensitiveness to heat, the other cylinder being used to test sensitiveness to cold. For this purpose the natural coldness of the metal may be sufficient (especially in winter), or the cylinder may be filled with cold water or ice. Experiments made in the Frankfort Physical Society by a chemist (Dr. W. Epstein) and myself have shown that for tests with high degrees of cold, which seldom come into consideration, since intense cold (like excessive heat) causes the irritation of pain, ammonium nitrate is the most suitable material. It is inexpensive, may be obtained in large crystals and is easily introduced into the cylinder. The fact, however, that it does not re-crystallize spontaneously, after the addition of the water necessary to dissolve it and bring out this intense cold, makes a new filling requisite before each examination. Experiments have determined, however, that the differences in temperature may be plainly recognized by healthy persons for fully fifteen minutes when the cylinder is filled only with cold water, this time being amply sufficient even for very minute tests of the sense of temperature.

Both metallic cylinders are closed by screwing the caps on tight, permitting the alternate use of cold and heat without danger of leakage. It is obvious that this method of examination is much easier than the one in general use, with several test tubes of different temperature, not to mention the greater ease of transportation, and the advantage of being able to trace immediately with the dermograph the limits obtained.

Society Proceedings

PHILADELPHIA NEUROLOGICAL SOCIETY

October 25, 1912

The President, Dr. John H. W. Rhein, in the Chair

TWO CASES OF MYATONIA CONGENITA

By Alfred Gordon, M.D.

Dr. Gordon exhibited two patients presenting partly the symptom-group of Oppenheim's disease and partly that of Werdnig-Hoffmann's type. He dwelled particularly on the existence of a large number of intermediary forms which from a clinical standpoint it is difficult to classify. He called attention to the pathological findings observed by various writers which are not infrequently contradictory to the clinical picture. His two cases present the general picture of weak muscular tonus, of a paretic condition of the limbs and of the trunk dating from birth, of loss of reflexes, of weak electrical response to faradism and galvanism. In one of his cases there was also double optic atrophy and a positive Wassermann reaction. In view of the existence of intermediary types, in view of the histological findings of one type, while clinically the case belonged to the other type, in view of the improvement of one series of cases when under proper treatment and of failure of improvement in another series of cases, Dr. Gordon concludes that it is legitimate to presume that in all such cases we are dealing probably with a prenatal disturbance of the nutrition of the cells of the anterior cornua which in some cases leads to their destruction, thus producing the Werdnig-Hoffmann type; in other cases the nutritional disorder remains slight with the result of only a diminished muscular tone. As the Wassermann test was positive in one of his cases, congenital syphilis may account for the nutritional disorder of the cells of the anterior cornua during the intrauterine life. Herein lies probably the favorable influence of the large doses of iodids in this particular case.

Dr. Spiller said that the case presented did not appear to him as one of myatonia congenita. The limbs were not in a condition of hypotonia.

Dr. Gordon said that in his paper he emphasized the fact that his patient at this period has considerably improved. Oppenheim in his original contribution says that one of the characteristic symptoms of his disease was the tendency to improve. In the next place he mentioned the fact that there were many intermediary cases having relationship on one hand to Oppenheim's disease and on the other to Werdnig-Hoffmann's type. In his case the patient could not and still cannot sit up well, the reflexes are lost, the electrical reactions are diminished, the head still cannot be held up erect. What other diagnosis can be made but that the case is allied to both above mentioned affections?

CEREBRAL INTERMITTENT CLAUDICATION

By T. H. Weisenburg, M.D.

The patient is a boy of 14 who at three months had erysipelas which was complicated by an encephalitic attack and was followed by convulsions which were typically epileptic. These occurred frequently until the boy was five years of age. Since then he has had attacks only once in two years and for the last four years there has been only one spasm. The parents noticed that at the age of five the boy began to have what were termed sick spells, in which he became paralyzed on the right side, this lasting at times from a few minutes to several hours or a day. About a year after that he began to have similar attacks on the left side, and since then, when excited or sometimes without any cause, he develops a hemiplegic attack either on the right or left side and rarely both. If the attack is right-sided it is accompanied by a complete motor aphasia during which the patient understands everything that is said to him and will repeat conversations afterwards. If left-sided there are no speech difficulties. In the most severe attacks both sides are involved. During an attack, if, for example, right-sided, the boy's gait is typically hemiplegic, the arms and legs being held in the typical contracted position. The reflexes are much increased and there is a typical Babinski. Between the spasms the limbs have the usual tonicity without any contracture and a normal plantar reflex.

No similar case is on record. Cerebral intermittent claudication is rare in itself but has been described as occurring in adults. The presumption is that because of the encephalitis following the erysipelas there has been produced a disease of the middle cerebral vessels which every once in a while close up and cause a temporary anemia of the motor area, this producing temporary hemiplegia.

Dr. J. W. McConnell said that Dr. Weisenburg's patient reminded him very much of a case that he reported some years ago before the Society, in which a temporary paralysis, at times of one side of the body, and again of the other, seemed to take the place of the ordinary epileptic seizures, which were the patient's chronic complaint. These transient paralyses lasted but a short time, and in the interval there was absolutely no evidence of loss of power. She was entirely free from post-epileptic features. At the time he reported his case he called attention to the paper by Flatau on "Transient Paralyses as Epileptic Equivalents."

Dr. Alfred Gordon said that in his study on various reflexes in conjunction with his reflex he observed the toe phenomenon very frequently immediately after attacks of epilepsy. It disappeared between the attacks. Dr. Gordon has also seen epileptic seizures limited to tonic movements alone especially in children, with or without loss of consciousness. This he has seen mostly in cases of focal epilepsy. Dr. Weisenburg's case suggests such an occurrence.

In closing, Dr. Weisenburg stated that the cases described by Dr. McConnell were different from the patient presented before the Society because in Dr. McConnell's cases the hemiplegic attacks were substituted for the epileptic attacks, whereas in Dr. Weisenburg's patient there is no substitution whatsoever, for in the past four years there had only been one attack of epilepsy and so far as he knew the case was typically one of cerebral intermittent claudication and could not be explained on any other ground.

Dr. Charles W. Burr exhibited a negro with paralysis agitans and spoke of the extreme rarity of the disease in that race, the patient being the only negro in ninety-two successive patients admitted to the Philadelphia General Hospital.

Dr. Gordon said he wished to put on record a case of paralysis agitans seen by him recently in a negro physician of West Virginia. He presented all the typical symptoms of the disease with the exception of the tremor, which although present was not very pronounced. The gait, attitude, masklike facies were all present. The disease is unquestionably rare in the colored race.

Dr. Dercum agreed with Dr. Burr as to the diagnosis and stated that he himself had never met with a case of paralysis agitans in a negro.

In discussing Dr. Burr's paper on "Paralysis Agitans in Negroes," Dr. Augustus A. Eshner said that his experience was in entire accord with that of Dr. Burr and Dr. Dercum. He had no recollection of having seen a case of paralysis agitans in a negro. Comparatively few negroes appear in the dispensary service of the Orthopedic Hospital, and apart from organic affections, particularly those due to syphilis, it seemed probable that nervous diseases in general occurred less commonly in negroes than in whites. Dr. Burr had earlier pointed out the rarity, if not the actual absence, of locomotor ataxia in negroes. Dr. Eshner had observed the same relation with respect to progressive muscular dystrophy, and inquiry among southern physicians on this point confirmed the infrequency of nervous diseases among negroes, even when they formed a large proportion of the population. When tremor was wanting in cases of paralysis agitans, it was as a rule late in the disease, when a considerable degree of rigidity is present, and in consequence of which the characteristic movements are suppressed. Under such circumstances a history of tremor at some stage of the disease can be elicited. It may be doubted if paralysis agitans occurs without tremor at any time in its evolution. Probably in Dr. Burr's case it has merely been overlooked.

A CASE OF CEREBRAL HEMIPLEGIA WITH ATROPHY, FLACCIDITY AND LOSS OF REFLEXES

By F. X. Dercum, M.D.

H. L. B., male, age 31, draughtsman, married. Admitted to the Jefferson Hospital, June, 1912. (History obtained from mother who accompanies patient. Patient himself is markedly aphasic.)

Family History.—Father and mother both living and well. Patient has one brother and one sister, both older and both well. Has three children. All of them are well.

Personal History.—Patient himself had measles and whooping cough in childhood. Has had no other illness either in youth or early adult life.

While perfectly well on June 10, 1909, he slipped while walking across a gangplank at a boatlanding. He fell, striking the back of his head. He did not become unconscious, picked himself up but felt considerable pain in his head. He was not obliged to call a physician and remained up and around notwithstanding the fact that the pain in his head persisted. From all that can be gathered, his headache was very severe.

Ten days after the fall, while sitting in a chair at his home in the evening, he suddenly lost consciousness. Consciousness returned some time during the night and it was then observed that he was paralyzed in the right leg and right arm and that he had lost his speech; he was unable to express himself and was unable to understand what was said to him. For a time he did not appear to recognize his own relatives. The paralysis remained very pronounced for eight weeks, after which time he began to get around and about a little. Five months after the attack he began to talk a little and also to understand a little what was said to him. He evidently could hear perfectly but had great difficulty in understanding.

Soon after the attack, within ten or twelve days, it was noticed that the muscles of the right arm and right leg were wasting; the difference in size speedily became very pronounced.

Condition upon Admission.—Station with eyes closed betrays no ataxia. He bears his weight upon the left leg alone but with some difficulty upon the right. In walking he throws the right leg as though it were weak and flaccid while the right arm is allowed to hang in a pendulous manner. The grip of the right hand is very weak, and the movements of the right hand and arm are distinctly ataxic. The fingers of the right hand are flexed and extended awkwardly and with very great effort. The tendency is for the wrist and hand to be flexed upon the forearm but there is no tendency to contracture. Occasionally faint athetoid movements are noted.

The lower half of the right side of the face is perhaps a trifle flattened, but the right angle of the mouth is retracted almost as well as the left. The right nasolabial fold is a trifle shallow as compared with the left. The right palpebral fissure is perhaps a very little larger than the left. However, the facial inequality is very slight.

Marked wasting is noted in the muscles of the right shoulder, right arm, forearm and hand. There is also decided wasting of the muscles of the thigh and leg. The right supraspinatus is greatly atrophied, as is also the right infraspinatus and the right deltoid. The angle of the right scapula also flares a little as though the serratus were wasted. The wasting of the arm and the forearm appears to be diffused and general. In the hand it is noticed that the thenar and hypothenar eminences are small and that the palm is hollowed out. Interosseous wasting is not very evident if present. Fibrillary tremors can nowhere be observed nor can they be elicited by tapping.

Electrical examination by Dr. Price failed to reveal any reaction of degeneration in the atrophied muscles. In the supraspinatus, however, the anodal closure contraction was somewhat more pronounced than in the other muscles but nothing approaching a reaction of degeneration was present.

An examination of the reflexes disclosed that the right bicipital reflex is present and somewhat pronounced. Upon the left side no tendon reflexes can be elicited whatever. The knee jerks are absent upon both sides; they cannot be obtained by reënforcement. The tendo-Achillis jerks are equally absent upon the two sides. Upon the right side there is a distinct and well marked Babinski sign; none upon the left. No ankle clonus is present upon either side. The sphincters are normal. The tongue is protruded in the median line. Tested carefully with regard to sensory losses, none whatever can be elicited. An equal response is obtained to tactile, pain and temperature tests upon the two sides of the body. The patient also accurately localizes, on the paralyzed side as elsewhere. He also correctly appreciates passive movements and changes of position in the various segments of his limbs on both sides. An examination of his special senses results negatively. The eye grounds are normal. The visual fields are normal. These observations were confirmed by Dr. Hansell.

A general visceral examination is negative. The heart is normal. The Wassermann examination is negative.

As already stated, the patient suffered at first from a very profound aphasia which appears to have been both sensory and motor, and which did not show much change until some five months had elapsed after the attack, when he began to improve. He could at first only say " No, no," and his tongue continued to be very "thick" for a long time. However, he gradually learned to understand many things that were said to him and also to say a few words. His case has not changed much of late.

His aphasic syndrome may be briefly summarized as follows:

Spontaneous speech is limited to a few isolated words and occasional phrases.

Spontaneous writing is limited to a few isolated words, such as hat, coat, his name.

He can repeat very imperfectly a few words spoken before him. A marked anarthria becomes evident. Thus he pronounces "tee" for key; improved is pronounced " chinchewed." Asked to repeat the phrase, "I fell three years ago," he says "I han je jears ago." For Constantinople he says " Tontanninoble." He regularly substitutes the "t" for "c," though he does not substitute as do so many aphasics a "d" for the "n."

Can understand an occasional simple sentence or an occasional simple instruction.

He fails when the instruction is at all complicated.

Can read simple written instructions but likewise fails when they are complicated.

Cannot read aloud.

Cannot write at dictation.

Can copy short phrases (with the left hand).

Is unable to name common objects. This inability to name them persists after the object is touched and handled. However, he evidently recognizes the object for he will answer "no" whenever the examiner gives an incorrect name to the object and invariably says "yes" when the examiner gives the correct name.

Cases of hemiplegia with atrophy of the paralyzed side are exceedingly rare. During his twenty-five years of service at Blockley Dr. Dercum saw but one other case and this he placed upon record in the *Philadelphia Hospital Reports,* Volume II, 1893, p. 153. In that case there was a marked atrophy and also an aphasia which appears to have been only partial. That case also differs from the one here shown in the fact that there was distinct rigidity of the paralyzed side and also marked exaggeration of the tendon reflexes. Furthermore, fibrillary tremors could be elicited by tapping, which cannot be done in the present case.

The pathology of hemiplegia with muscular atrophy is unknown but the occurrence of aphasia with the hemiplegia leaves no doubt as to its cerebral origin, i. e., there must be a focus of disease in the left hemisphere.

In every apoplexy, attended by hemiplegia, there is at first, it need hardly be recalled, a flaccid paralysis with loss of tendon reactions, and it would appear that in some cases—a very small number to be sure—this flaccidity persists, is never replaced by rigidity, reflexes never reappear and there is in addition a marked muscular wasting. Why this result should ever follow, it is impossible to say. Dr. Dercum knew of no autopsies bearing on these cases. Is it not possible perhaps that the nerve cells of the anterior cornua, whose function is always greatly depressed at the time of the original insult to the brain, in a small percentage of cases, never quite recover? This would account for the atrophy. However, there is no proof that this is really the case.

Dr. Maxwell Langdon reported a case of traumatic bilateral paralysis of the facial nerve, with complete loss of power in the upper branches and but little loss in the lower.

PITUITARY AND UNCINATE SYMPTOMS AND LESIONS

By Charles K. Mills, M.D. and Williams B. Cadwalader, M.D.

Two cases were presented to the Society for examination and discussion. The first case was a powerful looking young man, who had gained one hundred pounds in four or five years. His sexual power began to fail and his vision became impaired about eight months before coming under observation. He had bitemporal hemianopsia, with greater involvement of the right eye. Both discs were atrophic. His testicles were somewhat atrophied. His hands were large; his skin was dry. He showed no unusual carbohydrate tolerance.

The second case was also a young man about thirty years old, who was a marked contrast to the first as he was thin, neurasthenic and weak looking. About eighteen or twenty months previous to coming under investigation he had begun to show neurasthenic symptoms, and soon falling out of the hair, increased flow of urine and impotence were present. The testicles were atrophied and pubic hair scanty. His voice was high pitched. Impaired resonance and bronchial breathing were present on the right side. Roentgen ray examination showed calcification of the pineal gland. The reporters expressed their intention of later recording these cases in greater detail.

In connection with the presentation of these cases remarks were made on the different types of pituitary disease—hypopituitarism, hyperpituitarism and dyspituitarism. Neither of the cases seemed to come clearly under either of these subdivisions, although they might be regarded as examples of different types of dyspituitarism. In neither of the cases were uncinate symptoms present. Notes were read however of several cases in which both pituitary and uncinate symptoms were present in the same case, and of others with symptoms of hypopituitarism, without the uncinate symptom complex. The uncinate symptoms showed themselves chiefly in the form of seizures with complete or partial unconsciousness and with phenomena of taste or smell, or of both; also with smacking of the lips or champing. In one of the cases severe convulsions were sometimes present as part of the seizures, or in the course of a series of attacks.

Some remarks were made on the probable site and extension of the lesions in the uncinate cases, these being sometimes due to invasion of the temporal lobe by pituitary growths, and probably, in other cases to invasion of the infundibulum or hypophysis by extrasellar neoplasms. It was stated that the two cases shown would probably be operated for the purpose of decompression, and also for removal or partial removal of the lesion, if this proved feasible. Both cases had been under pituitary, thyroid and tonic treatment.

Dr. Dercum thought it not impossible that in the first case shown by Dr. Mills and Dr. Cadwalader the pituitary body had been unduly active for a time and that to this excess of activity the rapid growth noted at sixteen years of age was due, and that subsequently the activity of the pituitary became lessened, in fact subnormal, and that this would account for the adiposity which is present. In other words, Dr. Dercum thought that in this case there had been first a hyperpituitarism, followed some time after by hypopituitarism. The man's features are not typically acromegalic but are unquestionably large, as are also the hands.

Dr. Dercum also pointed out that the recognition of cases of incomplete acromegaly is just as important as those in which the acromegalic phenomena are pronounced. He is quite satisfied that such cases are frequently overlooked as are incomplete cases of myxedema.

The second case shown by Dr. Mills and Dr. Cadwalader, the one with the calcification of the pineal gland, presented, as could readily be seen, striking acromegalic features. Dr. Dercum believed that we must not always expect the skiagraph to show the enlarged pituitary fossa or disappearance of the posterior clinoid processes. It is quite conceivable indeed that there should be increased functional activity of the pituitary without there being a decided enlargement of the gland.

Dr. J. Hendrie Lloyd said this subject had undergone such an enormous and rapid development in very recent time that it was somewhat difficult to keep pace with it, and the thought had sometimes occurred to him that it was in some danger of being overdone. We had been seeing elaborate descriptions of hyperpituitarism, hypopituitarism, and dyspituitarism, and voluminous works were being written on the subject. It was a rather curious thought that whereas formerly we had regarded the hypophysis as little more than a vestigial body, we were now told that it was of enormous importance in its physiological and pathological activities. It was really not one organ but two, or rather a dual or conjoint organ, the anterior part being formed by a prolongation upward of the stomodeum or epiblast of the buccal cavity, while the posterior part was a prolongation downward of the inter-brain. Dr. Lloyd believed it was regarded by some morphologists, as Gaskell, as the remains of what was in pre-vertebrates a gastrointestinal tube. He wished Drs. Mills and Cadwalader had gone more fully into a discussion of the symptomatology, and especially had told the society what symptoms were to be attributed to the one portion of the hypophysis and what to the other portion. There must, it would seem, be a difference, as the two portions were entirely distinct. Dr. Lloyd confessed that his own mind, after what he had read, was somewhat confused on this subject, and he felt that a good many unwarranted statements and claims were being made by some writers on affections of the pituitary body. This criticism, however, did not apply to Drs. Mills and Cadwalader, whose claims were more conservative.

Their cases, presented before the society, prompted one or two comments. First, in reference to the interpretation of x-ray pictures. In one patient it was said that an x-ray picture taken in Vienna showed changes in the sella turcica, while an x-ray picture in the same patient taken in Philadelphia showed nothing but a possible slight calcification of the pineal body. These two things were very different, and illustrated the difficulties and dangers of drawing conclusions from these skiagrams.

Secondly, the changes in the optic nerves occurred in a patient who had had a severe otitic abscess. Might there not have been some septic meningitis and optic neuritis? Dr. Lloyd had himself seen such an optic neuritis caused by a suppurating mastoid disease.

Dr. Lloyd said that he understood that there was a disposition in some quarters to claim that the muscular dystrophies were caused by pituitary disease, and he ventured the prediction that before long some cases of dementia præcox would be swept into this group. This only illustrates how rapidly we are progressing.

Dr. Alfred Gordon said that the question of hyper-, hypo- or dyspituitarism is far from being settled. In fact in any of the disorders of the pituitary body one cannot tell whether we have to deal with an exaggerated or diminished function of the gland. The same analogy we find in diseases of the thyroid gland, which is better studied than any other gland with internal secretions. As to a diagnosis during the patient's life, it is not always an easy matter. When bitemporal hemianopsia is present, disturbance of the pituitary gland should be suspected. In a case published by Dr. Gordon recently in the *Journal of the American Medical Association,* various diagnoses, such as paresis, multiple sclerosis and others, were made by a number of neurologists in spite of the presence of bitemporal hemianopsia. It is only when the patient began to accumulate large amounts of adipose tissue that the diagnosis commenced to suggest itself. In reality the man presented the symptom of Fröhlich's syndrome, viz., the gradually increasing adiposity, infantile genitalia, double optic atrophy, bitemporal hemianopsia. Autopsy verified the diagnosis, as a large bilobal tumor of the pituitary body was found. In this case six months before the patient died he developed disturbances of smell. The tumor was found to have destroyed the sella turcica and penetrated into the nasal fossæ. Perhaps the beginning of smell disturbance is a localizing sign in determination of the direction in which the tumor of the hypophysis is advancing.

With regard to Dr. Gordon's remarks Dr. Mills said that one of the cases presented showed disturbance of smell.

With respect to Dr. Dercum's remarks Dr. Mills believed that his first case probably showed some admixture of early acromegalic phenomena with development later of Fröhlich's syndrome. The man's features are large, as are his hands, and his growth was rapidly attained. Soon however he began to show signs of adiposity and the other phenomena mentioned in the report. Incomplete acromegalic or hyperpituitary cases as well as incomplete hypopituitary cases are probably not uncommon, and are sometimes amenable to glandular treatment.

With regard to Dr. Lloyd's remarks Dr. Mills said that whatever doubts might exist as to the certainty of all the results obtained by investigations, physiological, clinical and pathological, of the hypophysis, the idea that it was a purely vestigial organ had disappeared from the minds of those who had recently given the subject their attention. While x-ray investigations often give doubtful results, they had proved of much value in the examinations of the sella turcica and adjoining regions. Calcification of the pineal gland can certainly be clearly demonstrated, as was done not only in one case of the series presented at this meeting but also in a case of tumor previously presented to the society by Dr. Lloyd himself. The remarks and cases were presented only in brief abstract so as to save time at a meeting with a somewhat overcrowded program. Some of the matters referred to by Dr. Lloyd were more fully discussed in the paper as written.

NEW YORK NEUROLOGICAL SOCIETY

DECEMBER 3, 1912

The President, DR. L. PIERCE CLARK, in the Chair

CEREBRAL MANIFESTATION OCCURRING DURING THE SECONDARY STAGE OF SYPHILIS

By M. S. Gregory, M.D., and M. J. Karpas, M.D.

The patient was a young man of twenty, single, a chauffeur by occupation and temperate in his habits. About six months prior to his admission to Bellevue Hospital, on October 17, 1912, he had contracted a chancre for which he was treated by a physician.

Upon admission to the psychopathic ward the patient was dull, drowsy, answered few questions and showed some evidences of right-sided paralysis. On the following day he became completely paralyzed and was unable to speak, but understood a few simple questions. Physical examination showed right-sided hemiplegia, with Babinski and clonus (right); irregular pupils, which reacted to light and accommodation; defective gait and station; Wassermann was strongly positive in the blood and spinal fluid; globulin content much increased and there was a very high lymphocytosis of the cerebro-spinal fluid. Under salvarsan, mercury and potassium iodide the patient had made a gradual and progressive improvement.

Dr. Smith Ely Jelliffe, who had seen the patient during the early stages of his attack, said he had hardly expected to see such a decided improvement in his condition. He was particularly interested in the presence in this case of the classical 4-phase reaction and considered it significant in that here was a patient who did not have paresis and yet had the so-called classical paretic reactions.

Dr. D. M. Kaplan said he was interested to learn of a case of this kind, with the initial lesion dating back only six months, in which the test showed over 600 cells. Ravaut was the first one to point out the importance of cell counts in the cerebro-spinal fluid of patients in the secondary stage of syphilis. In the case shown by Dr. Gregory and Dr. Karpas, in addition to the high cell count, there was also an absence of the Fehling reduction test, which was usually found in acute forms of cerebro-spinal syphilis. It is of interest to note in the work of Plaut that the Wassermann was negative in the spinal fluid in cases of cerebro-spinal lues and positive in the serum. In some cases of early general paresis, the Wassermann may be absent in the cerebro-spinal fluid, as observed by Marie. Dr. Dana believes that the high cell count in certain general paresis cases indicated a transitional stage between cerebro-spinal syphilis and general paresis, or that they were the precocious cases of general paresis where the soil had been prepared by cerebro-spinal syphilis. There were also cases, Dr. Kaplan said, where the serological or blood picture was modified by treatment to such an extent that a laboratory diagnosis was no longer possible. In the case under discussion, for example, the final serological test certainly pointed toward general paresis. This fact was entirely omitted in the work of Hauptman, who analyzed some 44 cases of cerebro-spinal syphilis, and in a goodly number of these there was no pleocytosis at all. This, and other facts, should have minimized the value of the "Auswertungs Methode" of the Hamburg worker.

Dr. Benjamin Rosenbluth said that two recent cases were brought to his mind by the presentation. In one there was syphilitic involvement of the brain, giving a right hemiplegia, which promptly yielded to mercury. The second case was one which gave well-marked premonitory symptoms which were unrecognized by the internists, and only when he had an apoplectic seizure was the nature of the affection realized. Though thorough antiluetic treatment was immediately instituted, it was of no avail. The lessons were that treatment should be thorough before destruction has occurred. The speaker has the greatest faith in mercury for cerebro-spinal syphilis.

Dr. Foster Kennedy said that while the patient presented by Dr. Karpas apparently made a prompt improvement under the use of salvarsan, he could recall and one should remember equally successful results under the older methods of treatment. In one instance a man was brought to the Neurological Institute a couple of years ago who gave a history of a syphilitic infection of six years' standing. He had had two thrombotic attacks, the second one producing a complete paralysis of one arm and leg. From this he had recovered to a considerable extent when he developed a gummatous meningitis in the left cerebello-pontine angle which produced left-sided deafness and a complete left facial paralysis. Subsequent to this attack he suffered from a thrombosis of the cord, with paralysis of both lower extremities. His temperature became elevated, and for a time his condition was very serious. He was given mercurial inunctions, and finally, in spite of these three severe attacks, one of the brain, one of the meninges and one of the cord, he recovered to a sufficient degree to resume his work.

Dr. S. P. Goodhart said that recently, at the Mt. Sinai Hospital, he saw a patient of Dr. H. Goldenberg, who, about two months after the initial lesion, showed distinct involvement of the cranial nerves after an injection of salvarsan. These symptoms cleared up under the use of mercury and potassium iodide. The case rather suggested that the cranial symptoms were due to the salvarsan, and offered a contradiction to the claim made by Ehrlich. Two other similar cases had come under his observation within a year.

HISTORY OF A CASE OF CEREBELLAR TUMOR, WITH PRESENTATION OF SPECIMEN. RECOVERY

By Max Mailhouse, M.D., and William F. Verdi, M.D., of New Haven

The patient was a girl of fifteen years, who in April, 1909, then in her thirteenth year, became dizzy while dancing, and fell, striking her forehead with considerable force on a hard floor. Aside from a marked contusion over the left eye, there were no immediate symptoms. Several months after this, however, she began to lose flesh; her appetite, previously good, became whimsical; she became constipated, suffered from nausea, especially in the morning, and occasionally experienced other digestive disturbances during the day. In November, 1910, she first suffered from headache; it began with nausea in the morning and lasted throughout the day. At this time she did not localize the pain. The vomiting became more frequent and the headaches were now of such severity that she would lie with her eyes closed for hours, entirely regardless of anything about her. There was tenderness over the entire scalp, more marked in the occipital region. The vomiting was never of the projectile type. During this whole period of illness the optic disks and the vision were normal, and careful physical examination failed to reveal any signs of intra-cranial pressure. In March, 1911, after a severe attack of a week's duration similar to the others in its general symptoms, the optic disks began to show evidences of intra-cranial pressure, and the extra-ocular muscles signs of defective innervation. There now appeared slight swaying to one or the other side on walking a straight line, a moderate false nystagmus, and she held her head slightly cocked with the occiput leaning toward the right shoulder and the face looking toward the left; there was slight awkwardness in attempts at rapid pronation and supination of the forearms, but no difference between the two sides. The knee-jerks, at first quite feeble, were later obtained only by reënforcement; the Romberg symptom was not present. There were no changes in the tactile, pain and temperature sensations, and there was no astereognosis. The speech took on an explosive character; there was slight ataxia by the finger to nose test; there was no asynergy evidenced in the lower extremities. The attacks of headache were now recurring weekly and the ocular changes became more pronounced and threatening. Patient was operated upon in 1911 by Dr. Verdi. At first an occipital decompression was performed with pronounced benefit. Symptoms later returned and in 1912 a large cerebellar tumor was removed by Dr. Verdi, the patient surviving. The paper will appear in the JOURNAL.

Dr. William F. Verdi, of New Haven, who did the operative work in the case reported by Dr. Mailhouse, said the inability to locate the tumor in this case was due to the indefiniteness of the symptoms. An x-ray, taken after the first operation, showed nothing more than the area of decompression in the occipital region. As subsequent events showed, the tumor was not very deeply seated below the surface of the cerebellum; it was not covered by more than one centimeter of tissue.

Dr. Verdi said they had had a number of cases of cerebellar operation in New Haven A few years ago they had a case that had been previously operated on in Baltimore, where a decompression operation had been done, the symptoms subsequently recurring, as in this case. Upon operation, he found a tumor about the size of an English walnut, soft in consistence, and not as well outlined as the one in the case just reported. That patient was a boy of eighteen: he made an excellent recovery, and his gait, which had been very bad, improved to such an extent that he was able to dance and skate and ride a bicycle. Unfortunately, about two and a half years later, there was another recurrence, and at the third operation it was found that the growth had attained such a size that it was impossible to remove it.

Dr. B. Sachs, who had seen this patient several times in consultation, said it was a source of great satisfaction to learn that the young woman was on the road to complete recovery. He complimented Dr. Mailhouse and Dr. Verdi upon the excellent manner in which the case had been observed and handled, and said that the use of the Bier cup in holding the tumor during its enucleation was an exceedingly ingenious idea. The case was not only the most successful one of the kind they had ever had in New Haven, but one of the most successful cases of cerebellar operation on record. More than five years ago, Dr. Sachs said, he collected twenty-two cases of cerebellar operation, and among these there was not a single one in which the outcome was entirely satisfactory. Very few patients go on to complete recovery after such an operation.

In reviewing the history of this case, several lessons were to be learned: First, it emphasized the importance of taking care of the optic nerves. Loss of sight was most to be feared in cerebellar growths, and in this case the observations made by Dr. Alling on the condition of the optic nerves before and after the decompression operation showed conclusively that early and perhaps permanent blindness was averted by removal of the occipital bone, which was done long before the tumor was localizable. This procedure also relieved the headache and other symptoms.

The difficulty in localizing this tumor, Dr. Sachs said, was at least partly due to the fact that it had invaded, at a relatively early stage, both halves of the cerebellum, and only gave rise to general cerebellar symptoms; nothing that was of definite localizing value. The symptoms were gone over very carefully, and they were not able to decide as to which side was involved. Still, the outcome of the case was very gratifying, and would stimulate neurologists to renewed efforts in other cases. It was fortunate that the growth was so situated that it could be enucleated, and even if only a portion had been removed, the patient's condition would doubtless have been more satisfactory than it was before the operation.

Dr. I. Abrahamson said that usually, in cerebellar neoplasms, we found an external strabismus, not a bilateral internal strabismus, as was reported in this case. The speaker suggested that at the original operation, which was limited to a decompression, aspiration of the cerebellum might have afforded some clue as to the presence or absence of a tumor. He also emphasized the uselessness of external palpation in many cases, and referred to the late recurrence of the choked discs after the decompression operation, which was rather unusual and pointed to an interference with the intra-ventricular flow.

Referring to the use of the Bier cup in this case, Dr. Abrahamson thought such a procedure might prove injurious if too much suction were employed for the purpose of holding the tumor; the forceps or tenaculum would be less apt to do injury. He thought that the more marked choked disk on the right side rather pointed to a right-sided condition. The rather early occurrence of the cerebellar symptoms and choked disk pointed towards cerebellar involvement rather than to a frontal lesion.

Dr. S. P. Goodhart said the tendency to fall more towards one side than the other was sometimes of diagnostic value in the localization of cerebellar tumors. One could not, he thought, be influenced very largely by the side on which the choked disk was present. In a case of cerebellar tumor which was operated on by Dr. Charles A. Elsberg, there was a rapid recurrence of the choked disk, and in spite of a very early operation, almost total blindness persisted. A choked disk may appear early, before localizing symptoms indicate the site for surgical procedure.

Dr. William M. Leszynsky asked if any one present had seen any benefit derived from a subtemporal decompression in cerebellar growths.

Dr. Sachs said that he never depended upon subtemporal decompression in these cases, and that he always advised an occipital decompression.

Dr. Edward D. Fisher said he did not think the tendency to fall more towards one side than the other was of great diagnostic value in the localization of cerebellar growths. He had at present under his observation a boy of fourteen who had a tendency to stagger towards one side, but the speaker said he was not prepared to place much reliance on that symptom in determining the location of the cerebellar growth from which this patient was apparently suffering.

Dr. Fisher said that in a case like the one reported by Dr. Mailhouse and Dr. Verdi, where the exact localization of the growth was apparently impossible, he would advise exposing both sides of the cerebellum. In an obscure case of this kind that came under his observation, both sides of the bone were removed and fluid was found on one side. After the withdrawal of a certain amount of this fluid, the patient, a man of 30, made a very satisfactory recovery and was able to return to work. He was still in good health at present, eighteen months after the operation.

Dr. Mailhouse, in closing, said the first time the eyes were examined in this case, the right disk was a little more edematous than the left, but after the decompression operation, when the symptoms recurred, the left disk was a little more involved than the right, so that the conditions of the disks and eyegrounds were unreliable guides, at least in this instance. Another peculiarity of the case was that the choked disk came on rather late, and one misleading factor early in the history of the case was the periodicity of the headaches, similar to attacks of migraine. That, together with the history of headaches in the mother, helped to obscure the diagnosis.

Dr. Verdi, in closing, in reply to Dr. Abrahamson, said the Bier cup was simply placed upon the tumor mass to help steady it; it was absolutely impossible to do this with a pair of forceps or a tenaculum. The cup was not placed on the cerebellar tissue, and could not possibly do any harm. Dr. Verdi said he did not aspirate the cerebellum in this case at the time of the decompression operation. He had resorted to needling in a number of cases, and in dealing with a solid tumor the procedure was of practically no value, as the needle met with no resistance in passing through the tumor tissue. In dealing with cystic growths, of course, it was different. As to palpation of the skull, the speaker said they had found this very useful in several cases.

A CASE OF HYSTERICAL HEMIPLEGIA, WITH SPASM OF THE HAND

By Benjamin Rosenbluth, M.D.

The case was that of a girl, seventeen years old, who attended a school for cripples, as she was unable to work on account of weakness of her right side, especially the hand. The rather meager history obtained from the girl's father was that she was of normal birth; that before the age of five she had measles and diphtheria and possibly meningitis, but of the latter he was not sure. When she was four or five years old she had about ten convulsions, the nature of which he could not describe. There were four other children, all of them healthy.

The girl presented herself at the Beth Israel Hospital Dispensary on account of weakness of the right upper extremity, which she said was in constant motion, and for weakness and limping of the corresponding lower extremity. She stated that she was always weak on this side, but the first definite date she fixed as the beginning of her trouble was associated with two events occurring about six years ago. The first was when a man looked into the toilet where she happened to be sitting, and from which she ran in great fright. The second was when she fell from a swing, which she said aggravated her previous symptoms, and she dragged her right foot and had continual movements of the right hand.

At the present time the girl walked with a limp, coming down on the right side. The hand did not move as she walked. There was no Romberg. When the lower extremities were exposed, it could be seen that the body came down on the right side as the thigh was bent on the knee. As she progressed, the right leg was drawn up and swung in a fanciful way to the left thigh as a sort of a flail. The body was rotated at the hip. On lying down, the patient was able to make every movement perfectly, and had excellent and equal power on both sides of her body. The only symptom that it was difficult to eliminate was the movement and spasm of the fingers when the hand was pronated. In that position, the anterior muscles of the forearm were seen to be contracted and hard as if in a cramp. The examination of the rest of the body was negative.

Dr. Rosenbluth said the question arose here whether we had an organic condition purely by itself, or such a state with a hysteria engrafted upon it, or were the manifestations purely hysterical. Personally, he would rule out an organic lesion were it not for the spasmodic movement of the fingers of the right hand. The persistence of this, together with the cramp-like condition of the muscles, made one pause before relegating the case into the class of neuroses.

Dr. Abrahamson said the case was very similar to the one he had shown at the previous meeting of the Society as one of dystonia. This patient had the same peculiar gait, the same tortipelvis and a similar difficulty with the hand. In the present case, the patient's past history was uncertain, and it was possible that she originally had a hemiplegia. He was more inclined to accept the diagnosis of dystonia than that of hysteria.

Dr. J. Ramsay Hunt said that some months ago, when Dr. Fraenkel read his paper upon the subject of the dystonia of Oppenheim, the speaker had shown a case very similar to the one presented by Dr. Rosenbluth tonight and by Dr. Abrahamson at the last meeting. It was very significant, he thought, that within a year three cases had thus been presented to the Society which could not be definitely classified, and which were essentially very close to what Oppenheim had described as dystonia. In his own case, Dr. Hunt said, the extremities were more involved than the trunk. Oppenheim laid more emphasis on the involvement of the trunk.

Dr. Leszynsky said that in the presence of apparent tortipelvis, together with the spasm on muscular movement, and the absence of all spasm while the patient was asleep or at rest, the case shown was certainly very suggestive of Oppenheim's type of dystonia.

The president, Dr. Clark, said that in the absence of the early history of this case, one must be very careful before accepting the diagnosis of Oppenheim's disease. It was not uncommon to see little or no reflex alteration after early infantile cerebral palsies, and in such cases to find a condition of the hand suggestive of post-hemiplegic athetosis and spasticity. Even under those conditions, it was possible that we had to deal here with an engrafted or superadded disease like the dystonia of Oppenheim. It was possible that some of these old cases of infantile palsy had a very close analogy to what is now supposed to be pure and simple dystonia. The distinction would have added importance from a therapeutic standpoint.

Dr. Rosenbluth, in closing, said the only question with which we had to deal in this case was whether we had an organic condition, or a neurosis, or a combination of the two. He was not willing to regard it as a dystonia, though he did not look upon the latter condition as a clinical entity, and certainly not with an organic basis. The fact that the lower extremity lost its symptoms when the patient was at rest would stamp this as a hysteria, but the persistence of the cramp in the forearm should not rule out the possibility of a cerebral lesion.

UNILATERAL INTERMITTENT CLAUDICATION OF THE LUMBAR REGION

By J. Ramsay Hunt, M.D.

Dr. Hunt said that in February, 1912, he directed attention to the occurrence of intermittent claudication in the lumbar region.[1] The case described in that article presented the typical symptoms of this affection limited to the lower lumbar region on both sides, consisting of pains and cramp-like sensations which came on regularly while walking, and passed away after a brief period of rest. While sitting or in the recumbent posture, the patient was quite free from pain. The condition had persisted over a period of two years and was steadily growing worse. The pain and muscular cramps were situated below the level of the ribs posteriorly, and above the level of the crest of the ilium. These symptoms, the speaker said, he attributed to an imperfect flow of blood through the lumbar arteries, caused by an arteriosclerotic process in that portion of the abdominal aorta from which they took their origin, or of the lumbar arteries themselves.

Dr. Hunt said the case he now wished to record was similar, excepting that the lumbar pains were strictly limited to one side and there was an associated intermittent claudication of the lower extremities of twelve years' duration.

History.—The patient was a woman, 66 years of age, who had been under his care for intermittent claudication of both lower extremities for the past ten years. The symptoms were typical of this affection, and her case was fully described in a previous paper.[2] The left leg was more involved than the right, and there were the characteristic pains, cramps, paresthesia and rigidity on exertion, which disappeared after a brief period of rest. The femoral and popliteal arteries pulsated equally on the two sides, but the pulsation in the right dorsalis pedis was thread-like and was often not palpable, and there was only a feeble pulsation in the left posterior tibial. The left dorsalis pedis and the right posterior tibial showed good, strong pulsations.

Dr. Hunt said that since his original report of this case there had been practically no change in the local conditions, but the patient had developed a constant but moderate degree of glycosuria, which under a careful diet averaged 0.3 per cent.

Onset.—In April, 1912, the patient first noticed pain in the lumbar region of the left side when very tired or after exertion. This had gradually increased in frequency and severity. The pain was limited to that portion of the lumbar region, on the left side of the vertebral column, below the ribs and above the level of the crest of the ilium. When very severe, there was a tendency for the pain to extend somewhat laterally, but never beyond the mid-axillary line. It was described as sharp and knife-like; sometimes as if an iron claw were gripping her in the back; more often, however, it was a severe aching and throbbing pain, with weakness. The muscles did not feel as though they were cramped or in spasm, but there was often a swollen sensation as if there were an abscess there which would burst. The speaker said he had never been able to make out any swelling, although the patient insisted that the parts felt swollen. Sometimes, after the pains had persisted for a time after overexertion, the muscle mass was tender to deep pressure. The pain came on while walking, standing, or when sitting in an uncomfortable chair which did not support the back well, as when sitting at a desk writing. It always disappeared promptly after rest in the recumbent posture, and even the most violent paroxysms relaxed after a short rest in the recumbent posture, although a dull, aching pain might last for several hours if she had forced herself to stand or walk beyond her endurance during the day. In the morning, on arising, she was quite free from pain, and it was only after the exertion of the toilet that the pain reappeared. It never extended to the right side of the vertebral column. Her spine was perfectly normal in contour and mobility, and there was no pain in the sacro-iliac articulations. Passive and active movements of the hip joints in the recumbent posture caused no pain.

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[1] *American Journal of the Medical Sciences.*

[2] "Intermittent Claudication," *The Medical Record,* May 27, 1905, Case I.

The case was of interest, Dr. Hunt said, in showing that intermittent claudication of the lumbar region might occur as a unilateral affection, and this was to be ascribed to an obstruction in the flow of blood through one or more of the lumbar arteries on the left side, either in their course or at their origin within the abdominal aorta.

In conclusion, the speaker emphasized the etiological significance of this group of cases, and the importance of the vascular element in the production of the lumbar weakness and backaches of advanced life.

Dr. B. Sachs said that in speaking of intermittent claudication we should not fall into the error of using a clinical designation for a pathological condition. What were we to regard as the symptoms of intermittent claudication, which occurred as a clinical entity? The condition, first described by French writers and more recently by Erb, was characterized by a temporary paralysis of a certain muscle or group of muscles, which then disappeared. The muscular disability amounted almost to a paralysis.

Dr. Sachs said he recently had a case of intermittent claudication and erythromelalgia associated in the same patient, and it was interesting to note that this latter affection was also dependent upon changes in the peripheral arteries. He did not understand why we should regard pain as a particular feature of intermittent claudication; the essential feature of the condition was the paralysis, not pain.

Dr. Hunt said one recognizes a leg type of intermittent claudication, as well as an arm type. One recognizes intermittent claudication of the cerebral and spinal arteries as well as of certain visceral arteries. The important point in diagnosis was not the pain, but the intermittent character of the symptoms, which appear on exertion and cease during rest. Pain was not always present, even in the extremities. It was interesting, the speaker thought, to recognize these various clinical types of intermittent claudication, and in establishing a lumbar type one may perhaps make a slight advance in diagnosis, by separating certain lumbar backaches of vascular origin in middle and advanced life from the chronic rheumatism, chronic lumbago.

Dr. Clark said the literature was filled with descriptions of these various types of so-called intermittent claudication, and doubtless there was a tendency to enlarge and make the condition much more diffuse and irregular than was originally intended by Charcot. The type of cases described by Dr. Hunt was very interesting and suggestive, and might prove a step in the direction of clearing up those vague cases of backache not infrequently met with in elderly persons.

Dr. Sachs said that in speaking of intermittent claudication of cerebral arteries we were confusing pathological and clinical terms. He was opposed to the use of this designation for a pathological condition, and it should not be applied to a spasm of certain arteries of a temporary or intermittent character.

Dr. Foster Kennedy raised the query whether intermittent claudication was a transient thrombotic condition or a vascular spasm. The symptoms depended entirely upon the location of the vessels that were subjected to this condition; in some locations it would naturally give rise to pain; in others to cramp-like sensations, and if it occurred in the brain it might be associated with transitory paralysis or paresthesia. Instead of calling it an intermittent claudication, why not call it a spasm or thrombosis of the affected artery?

Dr. Smith Ely Jelliffe said that he would have to challenge one statement made by Dr. Hunt, and that was that pains as he described must be due to intermittent claudication. Pains similar to those described by Dr. Hunt might be found in connection with various fatigue phenomena in growing people and in those who had been confined to bed for a long time, where characteristic pains which were intermittent in type and relieved by rest were complained of. He also mentioned the fatigue pains in old poliomyelitis cases due to overuse of a limb. While there were doubtless cases in which lumbar pains were associated with arteriosclerotic changes in the peripheral blood vessels, he was not convinced that pains of the type described by Dr. Hunt were invariably an indication of intermittent claudication. He felt that Dr. Hunt had not meant precisely what he said. He believed that the general point of view was well taken—namely, that the recognition of a certain group of lumbar pains as due to local vascular disturbance, *i. e.*, an intermittent claudication, would push diagnosis forward and be a distinct aid to definite therapy.

Dr. Rosenbluth said, apropos of the remarks of Dr. Kennedy, that the condition of angiospasm was but regional as to symptoms. Thus, in collating his cases of intermittent claudication, he had ruled out cigarette-smoking as the potent factor, and since all of the cases were as a rule in rye-bread eaters, he felt that here we no doubt had slow and persistent ergotism. The affect on the blood-vessels must be universal. but in the lower extremity, where the circulation below the knee is derived from but one large vessel, it caused the greatest interference with the blood stream.

Dr. Hunt, in closing, said that we used this term intermittent claudication in honor of Charcot, who gave such a clear description of the condition many years ago. Charcot used the term in a very limited sense. In these cases, there was an arterial supply which conveyed sufficient blood to the parts when at rest, but after increased exertion the blood supply became insufficient and a local anemia resulted. Intermittent claudication could not possibly be mistaken for fatigue pains, or other conditions, such as Dr. Jelliffe referred to, and the speaker said he did not know of any organic condition with which it could be confounded, when the symptoms were well defined and proper care was used in the study of the case.

Translations

MYTH OF THE BIRTH OF THE HERO

[A Psychological Interpretation of Mythology]

By Otto Rank

of Vienna

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(Continued from page 57)

At any rate, besides the astral conception, the claims of the part played by the psychic life must be credited with the same rights for myth formation, and this plea will be amply vindicated by the results of our method of interpretation. With this object we shall first take up the legendary material on which such a psychological interpretation is to be attempted for the first time on a large scale; selecting from the mass[28] of these chiefly biographical hero myths those which are the best known, and some which are especially characteristic. These myths will be given in abbreviated form as far as relevant for this investigation, with statements concerning the permanence. Attention will be called to the most important, constantly recurrent motives by a difference in print.

Sargon

Probably the oldest transmitted hero myth in our possession is derived from the period of the foundation of Babylon (about 2800 B. C.), and concerns the birth history of its founder, Sargon the First. The literal translation of the report—which according to the mode of rendering appears to be an original inscription by King Sargon himself—is as follows:[23]

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[28] The great variability and wide distribution of the birth myths of the hero results from the above quoted writings of Bauer, Schubert and others, while their comprehensive contents and fine ramifications were especially discussed by Husing, Lessmann, and the other representatives of the modern direction.

Innumerable fairy tales, stories, and poems of all times, up to the most recent dramatic and novelistic literature, show very distinct individual main motives of this myth.

" Sargon, the mighty king, King of Agade, am I. *My mother was a vestal, my father I knew not,* while my father's brother dwelt in the mountains. In my city Azupirani, which is situated on the bank of the Euphrates, my mother, the vestal, bore me. *In a hidden place she brought me forth. She laid me in a vessel made of reeds,* closed my door with pitch, and *dropped me down into the river,* which did not drown me. The river carried me to Akki, the water carrier. Akki the water carrier lifted me up in the kindness of his heart, Akki the water carrier raised me as his own son, Akki the water carrier made of me his gardener. In my work as a gardener I was beloved by Istar, I became the king, and for 45 years I held kingly sway."

MOSES

The biblical birth history of Moses, which is told in Exodus, chapter 2, presents the greatest similarity to the Sargon legend, even an almost literal correspondence of individual traits.[24] Already the first chapter (22) relates that Pharaoh commanded his people to throw into the water all sons which were born to Hebrews, while the daughters were permitted to live; the reason for this order being referred to the overfertility of the Israelites. The second chapter continues as follows:

" And there went a man of the house of Levi, and took to wife a daughter of Levi. And the woman conceived, and bare a son: and when she saw him that he was a goodly child, she hid him three months. And when she could no longer hide him, she took for him an ark of bulrushes, and daubed it with slime and with pitch, and put the child therein; and she laid it in the flags by the river's brink. And his sister stood afar off to wit what would be done to him. And the daughter of Pharaoh came down to wash herself at the river; and her maidens walked along by the river's side and when she saw the ark among the flags, she sent her maid to fetch it. And when she opened it, she saw the child, and behold the babe wept. And she had compassion on him, and said, this is one of the Hebrews' children. Then said his sister to Pharaoh's daughter, Shall I go and call to thee a nurse of the Hebrew women, that she may nurse the child for thee? And Pharaoh's daughter said to her, Go. And the maid went and called the child's mother. And Pharaoh's daughter said unto her, Take this child away, and nurse it for me, and I will give thee wages. And the woman took the child, and nursed it. And the child grew, and she brought him unto Pharaoh's daughter, and he became her son. And she called his name Moses:[26] and she said, Because I drew him out of the water."

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[23] The various translations of the partly mutilated text differ only in unessential details. Compare Hommel's "History of Babylonia and Assyria" (Berlin, 1885), p. 302, where the sources of the tradition are likewise found, and A. Jeremias, "The Old Testament in the Light of the Ancient Orient," II edition, Leipzig, 1906, p. 410.

[24] On account of these resemblances, a dependence of the Exodus tale from the Sargon legend has often been assumed, but apparently not enough attention has been paid to certain fundamental distinctions, which will be taken up in detail in the interpretation.

[25] The parents of Moses were originally nameless, as were all persons in this, the oldest account. Their names were only conferred upon them by the priesthood. Chapter 6, 20, says: "And Amram took him Jocabed his father's sister to wife; and she bare him Aaron and Moses" [and their sister Miriam, IV, 26, 59]. Also compare Winckler, "History of Israel," II, and Jeremias, l. c., p. 408.

This account is ornamented by mythology through an account of the events preceding Moses' birth. In the sixtieth year after Joseph's death, the reigning Pharaoh saw in his dream an old man, who held a pair of scales, all the inhabitants of Egypt lay on one side, with only a sucking lamb on the other, but nevertheless this outweighed all the Egyptians. The startled king at once consulted the wise men and astrologers, who declared the dream to mean that a son would be born to the Israelites, who would destroy all Egypt. The king was frightened, and at once ordered the death of all newborn children of the Israelites in the entire country. On account of this tyrannical order, the Levite Amram, who lived in Goshen, meant to separate from his wife Jocabed, so as not to foredoom to certain death the children conceived from him. But this resolution was opposed later on by his daughter Miriam, who foretold with prophetic assurance that precisely the child suggested in the king's dream would come forth from her mother's womb, and would become the liberator of his people.[27]

Amram therefore rejoined his wife, from whom he had been separated for three years. At the end of three months, she conceived, and later on bore a boy at whose birth the entire house was illuminated by an extraordinary luminous radiance, suggesting the truth of the prophecy. (After Bergel, "Mythology of the Hebrews," Leipzig, 1882.)

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[26] The name, according to Winckler ("Babylonian Mental Culture," p. 119), means "The Water-Drawer" (see also Winckler, "Ancient Oriental Studies," III, 468, etc.), which would still further approach the Moses legend to the Sargon legend, for the name Akki signifies I have drawn water.

[27] Schemot Rabba, fol. 2, 4. Concerning 2, Moses 1, 22, says that Pharaoh was told by the astrologers of a woman who was pregnant with the Redeemer of Israel.

Similar accounts are given of the birth of the ancestor of the Hebrew nation, Abraham. He was a son of Therach—Nimrod's captain—and Amtelai. Prior to his birth, it was revealed to King Nimrod, from the stars, that the coming child would overthrow the thrones of powerful princes, and take possession of their lands. King Nimrod means to have the child killed immediately after its birth. But when the boy is requested from Therach, he says: Truly a son was born to me, but he has died. He then delivers a strange child, concealing his own son in a cave underneath the ground, where God permits him to suck milk from a finger of the right hand. In this cave, Abraham is said to have remained until the third (according to others the tenth) year of his life. (Compare Beer, "The Life of Abraham," according to the interpretation of Jewish traditions, Leipzig, 1859, and Aug. Wünsche, "From Israel's Temples of Learning," Leipzig, 1907.)

KARNA

A close relationship with the Sargon legend is also shown in certain features of the ancient Hindu epic[28] Mahâb hàràta, of the birth of the hero Karna. The contents of the legend are briefly rendered by Lassen ("Indische Altertumskunde," I, p. 63).[29]

The princess Pritha, also known as Kunti, bore as a virgin the boy Karna, whose father was the sun god Surya. The young Karna was born with the golden ear ornaments of his father and with an unbreakable coat of mail. The mother in her distress concealed and exposed the boy. In the adaptation of the myth by A. Holtzmann,[30] verse 1458 reads: "Then my nurse and I made a large basket of rushes, placed a lid thereon, and lined it with wax; into this basket I laid the boy and carried him down to the river

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[28] The Hindu birth legend of the mythical king Vikra mâditza must also be mentioned in this connection. Here again occur the barren marriage of the parents, the miraculous conception, ill-omened warnings, the exposure of the boy in the forest, his nourishment with honey, finally the acknowledgment by the father. (See Jülg, "Mongolian Fairy Tales." Innsbruck, 1868, p. 73, et seq.)

[29] "Hindu Legends," Karlsruhe, 1846, Part II, pp. 117 to 127.

[30] "Hindu Legends," l. c.

Agva." Floating on the waves, the basket reaches the river Ganga and travels as far as the city of Campa. "There was passing along the bank of the river, the charioteer, the noble friend of Dhrtarastra, and with him was Radha, his beautiful and pious spouse. She was wrapt in deep sorrow, because no son had been given to her. On the river she saw the basket, which the waves carried close to her on the shore; she showed it to Azirath, who went and drew it forth from the waves." The two take care of the boy and raise him as their own child.

Kunti later on marries King Pandu, who is forced to refrain from conjugal intercourse by the curse that he is to die in the arms of his spouse. But Kunti bears three sons, again through divine conception, one of the children being born in the cave of a wolf. One day Pandu dies in the embrace of his second wife. The sons grow up, and at a tournament which they arrange, Karna appears to measure his strength against the best fighter, Arjuna, the son of Kunti. Arjuna scoffingly refuses to fight the charioteer's son. In order to make him a worthy opponent, one of those present anoints him as king. Meanwhile Kunti has recognized Karna as her son, by the divine mark, and prays him to desist from the contest with his brother, revealing to him the secret of his birth. But he considers her revelation as a fantastic tale, and insists implacably upon satisfaction. He falls in the combat, struck by Arjuna's arrow. (Compare the detailed account in Lefmann's "History of Ancient India," Berlin, 1890, p. 181, et seq.)

A striking resemblance of the entire structure with the Karna legend is presented by the birth history of Ton, the ancestor of the Tonians, of whom a relatively late tradition states the following:[31]

Apollo, in the grotto of the rock of the Athenian Acropolis, procreated a son with Kreusa, the daughter of Erechtheus. In this grotto the boy was also born, and exposed; the mother leaves the child behind in a woven basket, in the hope that Apollo will not leave his son to perish. On Apollo's request, Hermes carries the child the same night to Delphi, where the priestess finds him on the threshold of the temple in the morning. She brings the boy up, and when he has grown into a youth makes him a servant of the temple. Erechtheus later on gave his daughter Kreusa in marriage to the immigrated Xuthos. As the marriage long remained childless, they addressed the Delphian oracle, praying to be blessed with progeny. The god reveals to Xuthos that the first to meet him on leaving the sanctuary is his son. He hastens outside and meets the youth, whom he joyfully greets as his own son, giving him the name Ton, which means "Walker." Kreusa refuses to accept the youth as her son; her attempt to poison him fails, and the infuriated people turn against her. Ton is about to attack her, but Apollo, who did not wish the son to kill his own mother, enlightened the mind of the priestess so that she understood the connection. By means of the basket in which the newborn child had lain, Kreusa recognizes him as her son, and reveals to him the secret of his birth.

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[31] See Röscher, concerning the Ton of Euripides. Where no other source is stated, all Greek and Roman myths are taken from the Extensive Dictionary of Greek and Roman Mythology, edited by Röscher, which also contains a list of all sources.

ŒDIPUS

The parents of Œdipus, King Laios and his queen, Jocaste, lived for a long time in childless wedlock. Laios, who is longing for an heir, asks the Delphic Apollo for advice. The oracle answers that he may have a son if he so desires; but fate has ordained that his own son will kill him. Fearing the fulfilment of the oracle, Laios refrains from conjugal relations, but being intoxicated one day, he nevertheless procreates a son, whom he causes to be exposed in the river Kithairon, barely three days after his birth. In order to be quite sure that the child will perish, Laios orders his ankles to be pierced. According to the account of Sophocles, which is not the oldest, however, the shepherd who has been intrusted with the exposure, surrenders the boy to a shepherd of King Polybos, of Corinth, at whose court he is brought up, according to the universal statement. Others say that the boy was exposed in a box on the sea, and was taken from the water by Periböa, the wife of King Polybos, as she was rinsing her clothes by the shore.[32] Polybos brought him up as his own son.

Œdipus, on hearing accidentally that he is a foundling, asks the Delphian oracle for his own parents, but receives the prophecy that he will kill his father and marry his mother. In the belief that this prophecy refers to his foster parents, he flees from Corinth to Thebes, but on the way unwittingly kills his father Laios. By solving a riddle, he frees the City from the plague of the Sphinx, a man-devouring monster, and in reward is given the hand of Jocaste, his mother, as well as the throne of his father. The revelation of these horrors, and the subsequent misfortune of Œdipus, were a favorite subject for spectacular display among the Greek tragedians.

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[32] According to Bethe ("Theban Hero Songs"), "Thebanische Heldenlieder," the exposure on the waters was the original rendering. According to other versions, the boy is found and raised by horse herds; according to a later myth, by a countryman, Melibios.

An entire series of Christian legends have been elaborated on the pattern of the Œdipus myth, and the summarized contents of the Judas legend may serve as a paradigm of this group. Before his birth, his mother Cyborea, is warned by a dream that she will bear a wicked son, to the ruin of all his people. The parents expose the boy in a box on the sea. The waves cast the child ashore on the Isle of Scariot, where the childless queen finds him, and brings him up as her own. Later on, the royal couple have a son of their own, and the foundling, who feels himself slighted, kills his foster brother. As a fugitive from the country, he takes service at the court of Pilate, who made a confidant of him and placed him above his entire household. In a fight, Judas kills a neighbor, without knowing that he is his father. The widow of the murdered man, namely his own mother, then becomes his wife. After the revelation of these horrors, he repents and seeks the Saviour, who receives him among his apostles. His betrayal of Jesus is known from the Gospel.

The legend of St. Gregory on the stone—the subject of the narrative of Hartmann von Aue—represents a more complicated type of this mythical cycle. Gregory, the child of the incestuous union of royal lovers, is exposed by his mother in a box on the sea, saved and raised by fishermen, and is then educated in a convent for the church. But he prefers the life of a knight, is victorious in combats, and in reward is given the hand of the princess, his mother. After the discovery of the incest, Gregory does penance for seventeen years, on a rock in the midst of the sea, and he is finally made the Pope, at the command of God. (Compare Choledicus, "History of German Poetry, According to the Antique Elements.")

A very similar legend is the Tranese legend of King Dârâb, told by King Firdusi in the Book of Kings, and rendered by

Spiegel (Eranische Altertumskunde, II, 584). The last Karânian Behmen nominated as his successor his daughter and simultaneous wife Humâi; so that his son Sâsân was grieved and withdrew into solitude. A short time after the death of her husband, Humâi gave birth to a son, whom she resolved to expose. He was placed in a box, which was put into the Euphrates, and drifted down stream, until it was held up by a stone, which had been placed in the water by a tanner. The box with the child was found by him, and he carried the boy to his wife, who had recently lost her own child. The couple agreed to raise the foundling, and as the boy grew up, he soon became so strong that the other children were unable to resist him. He did not care for the work of his father, but learned to be a warrior. His foster mother was forced by him to reveal the secret of his origin, and he joined the army which Humâi was then sending out to fight the king of Rûm. Her attention being called to him by his bravery, Humâi readily recognized him as her son, and named him her successor.

(*To be continued*)

Periscope

Monatsschrift für Psychiatrie und Neurologie

(Vol. 30, No. 3. September, 1911)

1. Types of Course in Dementia Præcox. Pfersdorff.
2. Experimental Contribution Concerning the Return of the Knee-jerk after Pyramidal Lesions in Tabes Dorsalis. N. Ossokin.
3. A Special Form of Encephalopathia Saturnina (Meningitis Serosa). Otto Maas.
4. Paranucleoli and Hyaline Bodies of the Nerve Karyoplasm. G. Biondi.

1. *Dementia Præcox.*—A material of twenty-three cases which had certain similarities, in symptoms and course, to manic depressive-psychosis, is divided into four groups according to onset, remissions and termination. Some indefinite conclusions are drawn regarding possible prognosis.

2. *Knee-reflex.*—The author repeated on a dog the experiment of Bickel. The posterior lumbar roots were cut, with resulting ataxia and lost knee-reflexes. Three weeks later the pyramids were destroyed at the medulla. After this second operation the reflexes returned and there was a spastic paraplegia of all legs. Degeneration of both posterior columns and pyramidal tracts was found. Bickel's theory is that the sensory impulse from tapping the knee can travel by roots of neighboring segments, when those immediately concerned with the reflex are destroyed, but that, when thus conveyed, they are unable to overcome the inhibiting tendency of the pyramidal tracts, until these also are interfered with.

3. *Meningitis Serosa.*—Six cases are reported. The symptoms in all were persistent headache, optic atrophy and occasional vomiting, covering a period of many years. In all but one, the affection seemed directly traceable to lead poisoning, although somatic indications of this were lacking. Only two cases came to autopsy and in only one of these is the brain described. The condition in this seemed to be chiefly a distention of the ventricles.

4. *Paranucleoli.*—By the employment of various stains the author shows that the acidophilic paranucleoli found in the nerve cells of fowls are identical with the hyalin bodies described by Cajal in man and other mammals.

(Vol. 30, No. 4. October, 1911)

1. Ulnar Paralysis. K. Singer.
2. Association Studies in Defect Psychoses. M. Rohde.
3. Anatomical Findings in a Case of Microcephalic Idiocy. S. Kryzan.

1 and 2 are continued articles and will be reviewed at their conclusions.

3. *Idiocy.*—The brain weighed 407 grams. The most important feature was the relation in size between the cerebrum and cerebellum. The latter shared almost none in the reduction. Transverse section showed reduction in the association bundles of corpus callosum and con-

volutions. The third frontal convolution was only rudimentary, the anterior central was lacking entirely. The island was exposed by reason of the poorly developed opercula. The parieto-occipital fissure extended far onto the convexity (affenspalte). The cells of the cortex showed a fairly normal arrangement but were definitely low in numbers.

(Vol. 30, No. 5. November, 1911)

1. Malformations of the Brain of the Human Fetus, with Remarks on the Genesis of Brain Hernia and the Formation of Clefts in Brain and Skull. MASUDA.
2. Ulnar Paralysis. SINGER.
3. Association Processes in Defect Psychoses. ROHDE.

1. *Malformations.*—Two cases of anencephaly in fetuses four and five months old which show that the condition may occur by adhesion of the superficial tissues of the cranium to maternal parts. There was a combination of brain-rupture with cleft-formation of the anlage (anencephaly and amyelia). The bursted and torn sac was continued into the margins of the area medullovasculosa. These facts speak for a close relationship between the two conditions; both are secondary. There is therefore, besides a primary, a secondary occurrence of anencephaly and amyelia through the anlage being seized in the closure and again rupturing.

2 and 3 are continued articles and will be reviewed at their conclusion.

(Vol. 30, No. 6. December, 1911)

1. Tetany and Epilepsy. E. REDLICH.
2. Ulnar Paralysis. K. SINGER.
3. Association Processes in Defect Psychoses. M. ROHDE.

1. *Tetany and Epilepsy.*—To the author's own observations on eleven cases he adds those in seventy-two cases by other observers. A first group is of tetany occurring in cases who had epilepsy previously. The tetany was typical in that it occurred in young persons, chiefly in the male sex, and that the attacks came in winter and disappeared in summer. More important were the cases in which epileptic attacks occurred or true epilepsy developed during the course of the tetany. These latter are divided into those following removal of the para-thyreoids, the endemic-epidemic cases, the cases occurring during pregnancy and lactation and those in children. For the question of the relationship of tetany and epilepsy, the first, tetany parathyreopriva, are the most important, for here there is the obvious etiological factor of the removal of the "epithelial bodies." The tetany in these cases occurred within a very few days of the operation—the epilepsy from a few days to several months later. A review of all the cases, together with some animal experiments which are described, leads the author to the conclusion that the loss of the parathyreoids is the fundamental cause of both the tetany and the epilepsy, but that the "tetany toxin" itself does not produce epilepsy through its action on the brain. Rather, the cessation of the internal secretion of these glands produces alterations in metabolism or in other glands with internal secretions, which in turn produce the convulsions. It is significant that the large majority of all the cases came from Vienna.

2. *Ulnar Paralysis.*—A lengthy and detailed treatise on this affection. There is first a chapter on anatomy giving the motor and sensory distribution and function. Then follows a description of the various clinical pictures which one encounters in the disorder. The third and principal division is given over to a discussion of the very numerous causes, the manner in which they produce the condition and the pathological findings. The principal groups are those from mechanical injuries and those resulting from neuritides, traumatic, toxic, professional, etc. There are also combined paralyses and ulnar palsy occurring in other organic diseases such as tabes and syringomyelia. The diagnosis does not present serious difficulties. The prognosis for the acute cases with early improvement is good. When the condition becomes chronic, the hope of compete recovery becomes slight. If the nerve is completely severed by trauma, the recovery, especially in the motor function, is very slow, perhaps a matter of one or two years. The electrical reaction is naturally of importance. The treatment of the acute cases is chiefly by means of electricity, to which, in chronic cases, is added massage. In traumatic cases rest and fixation to promote healing are of first importance. The "main en griffe" contracture deformity may be corrected partially by mechanical appliances. In toxic cases and those due to syphilis, suitable general treatment is indicated.

3. *Association.*—The patients investigated were from the Charité and were selected as follows: thirteen cases of hebephrenic dementia præcox, seventeen cases of dementia paralytica, thirteen cases of epileptic psychosis. For comparison, one case of mania, two of melancholia, one of hysteria and one of post-diphtheritic deterioration were tested. The procedure did not differ essentially from that in general use. A list of words consisting of nouns, verbs and adjectives with a large variety of association possibilities was employed. The results are given in great detail but apparently afford nothing essentially new. His findings agree, in general, with other writers. The article contains many lengthy technical discussions which do not admit of synopsis.

J. W. Moore (Central Islip).

Revue Neurologique

(March 30, 1912)

1. A Case of Cavity in the Spinal Cord Following a Compression of the Medulla in a Man and an Experimental Study of the Spinal Cavities Produced by Compression. J. L'Hermitte and P. Boveri.
2. A New Reflex of the Thigh Observed in Insane Patients Affected with Cholera. Levi-Bianchini.

1. *Cavity in the Spinal Cord.*—The man was thirty-eight years old when he developed a progressive weakness in the legs. He was able to stand but not to walk. The upper extremities had normal strength and there was only a slight atrophy of the thenar and hypothenar eminences and of the right side of the tongue. Sensation was normal. The reflexes were exaggerated and the Babinski reflex was positive. There was a little dyspnea and cyanosis. He died suddenly with respiratory syncope. Autopsy showed that the spinal cord from the first cervical segment to the tenth dorsal segment was transformed into a tube. The lower end of the medulla was flattened by the pressure of an exostosis

from the occipital bone. The walls of the tube were only about one millimeter in thickness and from the fifth cervical to the eighth dorsal segments the gray matter had entirely disappeared. The walls of the cavity were composed of normal nerve tissue. The author experimented on an animal by causing a slowly increasing pressure on the spinal cord and produced an area of softening, without infection, due to interference with the intraspinal circulation. The absorption of the necrosed tissue would produce a cavity in the spinal cord.

2. *A New Reflex.*—The patient lies on his back with the leg drawn up. Squeezing the muscles of the calf of the leg, about the middle, is followed by a tetanic contraction of the quadriceps extensor. It is present in cholera, especially in the severe cases, and absent in doubtful cases or in normal individuals. It is a pathologic spinal reflex, of tetanic type, probably due to a cytotoxic effect on the nerve cells comparable to the spastic reflexes in tetanus infection.

(April 15, 1912)

1. A Histological Study of Five Cases of Tumor of the Spinal Cord. J. JUMENTIÉ AND MLLE. E. KONONOVA.
2. Aortitis and Tachycardia in General Paralysis. G. LAROCHE AND CH. RICHET, Jr.

1. *Tumor of the Spinal Cord.*—The five cases may be divided into three groups: the largest group (three cases) were fibro-sarcomata, and one each of psammoma and angiolipoma. The name "tumor of the spinal cord" is not strictly proper since the first two varieties grew from the soft meninges and the last was extradural. The practical points were: that all were solitary tumors, easily enucleated, non-malignant, with no tendency to metastasis, and were of very slow growth.

2. *Aortitis and Tachycardia in General Paralysis.*—Aortitis is present in 60 per cent. of tabetics, in 54 per cent. of cases of general paralysis with incipient tabes and in only 14 per cent. of cases of general paralysis alone. Tachycardia, which is common in tabes, is not present in general paralysis, and is very slight in cases of taboparalysis. The conclusion is that the aortitis is a trophic condition similar to perforating ulcer and is not due to syphilis directly.

(April 30, 1912)

1. The Syndrome of General Paralysis Following Trauma Caused by an Acute Meningitis of Tardy Evolution. RAYNEAU AND L. MARCHAND.
2. Mental Troubles in a Case of Serous Meningitis. MME. NATHALIE ZYLBERLAST.

1. *Traumatic General Paralysis.*—The patient sustained an injury to his head and other contusions causing a short period of unconsciousness. Following this there was some mental hebetude, headache, and loss of memory. The mental condition gradually grew worse. He became hallucinated, had grandiose delusions and his speech was incoherent. Seven months after the accident he was examined by Professor Joffroy who found his mental condition to be a state of confusion, with incapacity to fix the attention, a lacunar and diffuse amnesia and disorientation in time. There was no paralysis of the extremities and aside from

a pupillary inequality and a slight weakness of the facial muscles the examination was negative. The diagnosis was cerebral concussion with slight, multiple lesions and an added traumatic neurosis. The prognosis was regarded as grave and the patient was admitted to an asylum. Twenty months after the accident he was taken suddenly with fever. vomiting, epileptiform attacks and a left hemiplegia and died a few days later without regaining consciousness. Necropsy showed an acute suppurative meningitis. There were none of the lesions regarded as characteristic of general paralysis.

2. *Mental Troubles and Serous Meningitis.*—The patient, aged twenty years, had suffered for a long time with attacks of migraine and vomiting at the time of the menstrual periods. Following a particularly severe and prolonged attack there developed a mental state of confusion and excitement. Examination showed a choked disc of four diopters with retinal hemorrhage and an exaggeration of the tendon reflexes. The patient recovered in about two weeks and remained well. The author's diagnosis was serous meningitis.

(May 15, 1912)

1. Subacute Combined Degeneration of the Spinal Cord. E. Long.
2. Contribution to the Study of the Comparative Frequency of Different Symptoms of Organic Paralysis of the Lower Limbs of Central Origin. Élie Tziklice.

1. *Degeneration of the Spinal Cord.*—The disease began at the age of forty-six years with pains in the extremities, progressive incoördination, exaggeration of the tendon reflexes with ankle clonus and positive Babinski reflex. No lymphocytosis of the spinal fluid. The pupillary and sphincter reflexes were normal. In the last stages there was incontinence, complete paraplegia, edema of the legs and bedsores. The duration of the trouble was two years. There was no pernicious anemia. Necropsy and histological examination showed lesions in the white matter of the spinal cord. In the posterior columns it extended from the sacral region to the medulla. In the lateral columns the maximum lesion was in the cervical enlargement and diminished above and below. The anterior columns were affected only in the dorsal region. The lesions were symmetrical and their disposition was like that of a polyneuritis. The fact that, even in regions where the degeneration was secondary, the same histological picture was shown suggests that the nerve fibers conduct the toxic substance along their course from some primary focus..

2. *Frequency of Symptoms of Organic Hemiplegia.*—The symptom of Raïmiste, associated adduction and adduction associated with elevation. was present in 100 per cent. of cases; the other symptoms of Raïmiste, in from 86 per cent. to 90.9 per cent.; Babinski's reflex was present in 81.8 per cent.; Hoover's sign, in 74.6 per cent.; symptom of Grasset-Bychowsky, in 60.6 per cent.; Neri's sign, in 54.5 per cent.; Oppenheim's, in 51.5 per cent.; symptom of Rossolimo, in 45.4 per cent.; Mendel-Bechterew reflex, in 39.2 per cent.; and the symptom of Coccipuoli, in 40 per cent.

(May 30, 1912)

1. The Reflexes of Spinal Automatism; Their Physiologic and Semiologic Value. P. Marie and Ch. Foix.
2. Palilalia in a Case of Pseudobulbar Palsy. Frénel and Crinon.

1. *Reflex Spinal Automatism.*—A distinction should be made between the cutaneous reflexes properly so-called, such as the abdominal, cremasteric, etc., and the cutaneous reflexes of defense which exist normally but are greatly exaggerated when the cerebrospinal descending tracts are affected. The first group have a long reflex arc which includes the brain; the second have only a spinal course. Such reflexes as that of Gordon, Shaeffer and the "reflex of defense" of Babinski are not cutaneous reflexes solely, the stimulus being derived from tendon and joints as well.

2. *Palilalia.*—The symptom is described as "the involuntary repetition two or more times in succession of the same word or phrase." The patient, fifty-six years old, dated his difficulty in speech back to a stroke eight years before. He presented other symptoms of pseudobulbar palsy. There was no echolalia, no repetition of words in writing spontaneously or from a copy. He was fully aware of his speech difficulty but claimed that the repetition was irresistible.

(June 15, 1912)

Report of the proceedings of the "Congres des Medecins Alienistes et Neurologistes de France et des pays de langue Français." Tunis, April 1–7, 1912.

1. Dementia Præcox with Phenomena of Dyspraxia. Mabille.
2. The Perversions of Instincts. Dupré.
3. Nervous and Mental Complications of Malaria. Chavigny.
4. Care of the Insane in the Colonies. Regis.

1. *Dementia Præcox and Dyspraxia.*—Aboulia, perseveration, etc., regarded as dyspraxia of mental origin.

2. *Perversions of Instincts.*—The instincts are considered under three heads: the instinct of self-preservation, relating to the life of the individual; the instinct of reproduction, relating to the life of the species; and the instinct of association, relating to the life of society. Perversions of instincts appear with mental debility and in diverse pathologic associations. In grave forms they resist all treatment, in lighter cases they are susceptible of some improvement by education, example and moral culture, but such improvement is usually more apparent than real. The moral improvement of the perverse is a sentimental illusion of philanthropists and optimists. The author would substitute for the metaphysical and arbitrary notion of responsibility a positive and objective idea of the dangerousness of the pervert and provide special institutions for their detention.

3. *Nervous and Mental Complications of Malaria.*—Neuralgia and neuritis, myelitis, certain other affections of the spinal cord such as multiple sclerosis, tabes dorsalis and anterior poliomyelitis, certain transitory spinal paralyses, paralysis agitans and some cerebral affections have been ascribed to malarial infections. Epileptic attacks occur in malaria but the causal relation is not clear. Malaria may be an etiologic factor in neurasthenia and in some of the psychoses.

4. *Care of the Insane in the Colonies.*—A description of the establishments and methods for caring for the insane in the various colonies of France—Algeria, Morocco, Madagascar, etc., and the need of improvements.

MISCELLANY

Mentally Defective Immigrants. C. P. Knight. (Journal A. M. A., January 11.)

The methods used in the Public Health Service for the detection of idiots, imbeciles and feeble-minded immigrants are described by the author. One of the duties of the medical officer detailed for line examination is to detect these cases and hold them for further diagnosis. The difficulties can be appreciated when one considers the different nationalities, languages, etc., and the brief time allowed. Aliens of the cabin class are examined on ship-board between quarantine and the docks, and the examinations are especially difficult owing to the noise and general confusion and lack of accommodations, light and space. The detection of these cases is a matter of national importance and the cost to the country is very great. One of the principal measures for reducing defectives will be by lowering the percentage of defective aliens. The idiot is usually easily recognized. Cretins, microcephalics, hydrocephalics, if typical, cause no difficulty and the stigmata of degeneration are usually detectable in the imbeciles. The hardest problem is the feeble-minded school dunce, and the dividing line between these and the backward children who are nevertheless capable of education is often difficult to trace. The inspecting medical officer must be an expert, capable of deciding quickly what cases are to be detained for further study. An experienced officer familiar with racial characteristics and knowing something of the languages can detect the abnormal almost at a glance. The emotional southern Italian and the stolid Slav, the usually frank and open English or German and the evasive Jew have each their characteristics, and one type appearing with the characters of the other can at once excite suspicion. The alienist skilled in refined diagnosis in mental diseases would be useless in detection of the feeble-minded on primary inspection. The quality needed there is the ability to determine at once the normal and the abnormal, and the officers who have experience and skill in this will be our national advance guard for protection against the defective immigrant.

Alien Mental Defectives. H. A. Knox. (Journal A. M. A., January 11.)

The author, stationed at Ellis Island, calls attention to the alien insane in this country and more especially to the morons or high-class imbeciles among the immigrants. He thinks that their detection is vastly more important than that of the insane, who are much more quickly detected, while the moron may obtain a residence and propagate defectives. Skill will be required in the testing, for to the non-expert nearly all the peasants from certain European countries might appear defective. When questioned, however, about conditions in their own country most of them will show average intelligence. Their condition must also be taken into consideration, as after ten days of seasickness and the excitement of an unusual environment they may not do themselves justice. The interpreter must be kind and accurate and have special training for the work.

Book Reviews

NEUE LEHRE VOM ZENTRALEN NERVENSYSTEM. Von Dr. Emil Radl. Wilhelm Engelmann, Leipzig. 488 pages. 12 marks.

It is refreshing to find an author who departs from the orthodox neurological camp and attempts a new explanation of the nervous system. Such a departure was permissible, he writes, only after several years of research and after many paths had been explored which for the most part led him back to the reigning hypotheses.

The author follows the plan of the idealistic philosophy. He seeks a unitary basis for the structure of the entire animal world. He breaks a lance over the structure of the eye in opposition to the general teleological views of the origin of this organ.

The structure of the nerve cells is quite immaterial; it has no special significance. Neuropsychic processes take place through the nervous reticulum which he figures in a manner quite different from the usual figures.

The work is interesting. It is philosophical and is to be met in a spirit of enquiry rather than of criticism.

JELLIFFE.

CONDUCT AND ITS DISORDERS. BIOLOGICALLY CONSIDERED. By Charles Arthur Mercier, M.D. Macmillan & Co., London and New York.

Everything that Mercier has written has been of interest. The present work is no exception. It is most excellent and represents a perfect Spencerian flower in the garden of psychology.

Some do not like such rigid formalism. It is to their feeling too mechanical. It is forced. That, after all, is a matter of taste. The pedagogue will say, here is something worth while. It is; from the pedagogue's point of view. It is one of the very best bits of carefully worked out, and logically presented pieces of artificial psychology with which the reviewer is acquainted. I say artificial, I might just as well say scientific, intellectual, meaning by the latter what Bergson has said of the mechanical quality of intellectual limitations.

We must differ with Dr. Mercier when he says this is the first book on conduct published. We will grant it to be such in the sense of its being the first outline map of conduct, cut up into even squares and properly and neatly labelled. But from the standpoint of an understanding of human conduct, it bears the same relation that one's herbarium does to the living hillside. System follows system; what botanist today recalls how Dioscorides arranged his plants, or Fuchsius, even Linnaeus. while the systems of Hooker and Engler and Prantl now rule in official circles. Dr. Mercier's book from this standpoint was dead years ago; such descriptions of human conduct as he gives mean nothing. Homer, old as he is, has given a real book of human conduct—seen dynamically—more alive today than Mercier's book ever can be.

This is another point of view. So, to the former type of mind, one will find in it a confirmation and restatement of much that they themselves believe; to the latter it is of little value. Or perhaps let us express it differently, since all minds present kaleidoscopic variations. To those mental attitudes within us which encourage orderly and logical thinking about certain facets of what we regard as truth the book will be much appreciated, while those roving instinctive advances towards new truths will be left cold and almost terrified by the square patterns, all laid down in rows, like a Versailles garden.

JELLIFFE.

The Psychology of Insanity. By Bernard Hart. G. P. Putnam's Sons. N. Y.

This is a short and sketchy attempt to show the modern trend of Freudian psychology in its application to mental disease.

The author unfortunately attempts too much and hence has given a rather confused account of the situation. One would have thought he would have fought shy of the word insanity. How can a legal concept have a psychology. Is there such a thing as a psychology of arson, or burglary, or petit larceny. These are descriptive legal terms—utilized for the machinery of the law. So is insanity. It is an attempt in law to apply its machinery to problems of responsibility for antisocial acts It has nothing to do with the scientific problems of medicine in the field of mental pathology.

Not only does the author jumble the issues but he perpetuates this old source of confusion. He might have limited his discussion to certain psychoses, for certainly neither Freud nor Jung have ever attempted what Hart here would outline.

Such a work, however, is much needed, and this small volume will help to show the mechanisms of certain abnormal mental states to advantage to lay readers. It will call attention to material which professed students of mental phenomena have too long neglected.

JELLIFFE.

The Ancient Egyptians and their Influence upon the Civilization of Europe. By G. Elliot Smith. Harper & Brothers, New York.

This small pocket volume attacks the problem of the development of human civilization from a very interesting and profitable angle. Dr. Eliot from a study of the skeletons found in Egypt has attempted to trace the migrations of the different tribes who made up the mental-culture populations of this interesting region.

Now that psychiatry has commenced to take such an interest in early man and would attempt an explanation of many of the bizarre features in certain psychoses, notably in schizophrenia, as due to reversions to archaic modes of symbolic thinking, such a volume is of service in affording a quick glance at early Egyptian cultural periods, further study of which will provide comparative material for the purposes of the psychiater just outlined.

JELLIFFE.

News and Notes

THIRD INTERNATIONAL CONGRESS OF NEUROLOGY AND PSYCHIATRY

The Third International Congress of Neurology and Psychiatry will take place in 1913, on the 30th of August, at Gand, in Belgium. Preceding Congresses were in 1897 in Brussels and 1906 in Amsterdam.

The Congress will assemble shortly after the close of the London Medical Congress and the program promises many attractive features.

The secretary is Dr. Crocq, 62 Rue Joseph II, Brussels, to whom all communications should be sent, titles of papers, etc.

PROGRAM OF SECTIONS ON NEUROLOGY AND PSYCHIATRY

The extensive program of the International Medical Congress contains the following in the section of neuropathology and psychiatry.

Section XI.—Neuropathology

President

Sir David Ferrier, LL.D., M.D., F.R.C.P., F.R.S.

Secretaries

Fred E. Batten, M.D., F.R.C.P. H. Head, M.D., F.R.C.P., F.R.S.

Thursday, Aug. 7. 1. The Symptoms of Cerebellar Disease and their significance.

Reporters: Dr. J. Babinski, Paris, Professor Dr. Rothmann, Berlin.

Friday, Aug. 8. 2. Motor Aphasia, Anarthria and Apraxia.

Reporters: Professor Dejerine, Paris, Professor Dr. Liepmann, Berlin.

Saturday, Aug. 9. 3. The Relation of the Myopathies.

Reporters: Professor Dr. H. Oppenheim, Berlin, Professor Spiller, Philadelphia, U. S. A.

Monday, Aug. 11. 4. The Treatment of Tumors of the Brain, and the indications for operation. (Jointly with Section VII.)

Reporters: Professor Dr. Bruns, Hanover, Professor Harvey Cushing, Harvard University, U. S. A., Professor Dr. Freih. v. Eiselsberg, Vienna, Dr. H. H. Tooth, London.

Tuesday, Aug. 12. 5. The Nature of the Condition termed Parasyphilis.

Reporters: Dr. F. W. Mott, London, Professor Dr. Nonne, Hamburg.

Section XII.—Psychiatry

President

Sir **James Crichton-Browne**, LL.D., M.D., F.R.S., F.R.S.Ed.

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Maurice Craig, M.D., F.R.C.P. **James H. MacDonald**, M.B., Ch.B.
Edwin Goodall, M.D., F.R.C.P. **R. Percy Smith**, M.D., F.R.C.P.

Thursday, Aug. 7. 1. The Psychiatric Clinic, its aims (educational and therapeutic) and the results obtained in respect to promotion of recovery.
Reporters: Dr. **Adolf Meyer**, Baltimore, U. S. A., Professor Dr. **Sommer**, Giessen.

Friday, Aug. 8. 2. Psycho-Analysis.
Reporters: Professor P. **Janet**, Paris, Dr. **Karl Jung**, Küsnach—Zürich.

Saturday, Aug. 9. 3. The Psychoses of Infection and Auto-Intoxication.
Reporter: GHR. Professor Dr. K. **Bonhöffer**, Berlin.

Monday, Aug. 11. 4. The Syphilitic and the Para-Syphilitic Insanities.
Reporters: Professor Dr. W. v. **Bechterew**, St. Petersburg, Dr. A. **Marie**, Villejuif.

Tuesday, Aug. 12. 5. The Psychology of Crime. (Jointly with Section XIX.)
Reporter: Professor Comm. E. **Morselli**, Genoa.

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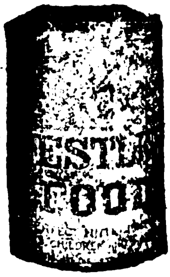

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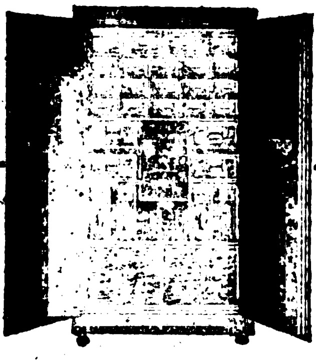

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Original Articles

THE PRESENT KNOWLEDGE OF THE STATUS OF APRAXIA WITH THE STUDY OF A CASE

By Alfred Glascock, M.D.

ASSISTANT PHYSICIAN, GOVERNMENT HOSPITAL FOR THE INSANE,
WASHINGTON, D. C.

There has not been, as yet, a unanimity of opinion among various investigators as regards the classification of disturbances included under apraxia in its widest sense, and only in comparatively recent years has it been recognized as a part to itself in the study of the aphasia complex. Within the past decade especially the field of literature upon the subject has been enriched through numerous cases reported, the improvement in the technic of the examination and the clearer knowledge of localization through the study of serial sections of the brain.

As we are to consider chiefly in this paper apraxia in its narrower sense, it would be wise in prelude to note through a brief historical sketch the changes occurring step by step in the nomenclature and it is to be seen that our present conception of these phenomena is quite different from that described under the earlier terminology.

As we now understand motor apraxia, we infer an inability to perform proper purposive movements without impairment of motility; objects cannot be properly manipulated, not because they are not rightly recognized or because the sensory memory pictures do not sufficiently assist the manipulation, but because the motor part of the action itself is out of order. The patient, although he recognizes the penholder, sticks it in his mouth because the action runs off the track. When an object is not recognized, it cannot be properly used and thus if an individual who is mentally blind or suffering from visual agnosia mistakes a penholder for a cigar, he will naturally stick it in his mouth.

Reviewing the earlier literature upon the subject, we find that Hughlings Jackson in 1866 was probably the first to recognize the disorder, which he termed imperception and his patient referred to at the time seemed to have lost much of his power to do anything he was told to do, even with the muscles that were not paralyzed. He was unable to protrude his tongue although he could use it well in eating and swallowing; nor could he make grimaces by command or by imitation. The patient could do a thing well at one time and not at another. Jackson referred to another patient who made efforts but never did what was told him, whether it was to look in a particular way or keep his eyes still. Instead of opening them he would open his mouth or screw up his face.

From Jackson's imperception there developed asymboly, a term first employed by Finkelnburg in 1870; for all types of defect of sign recognition he used this term, by which was understood the loss of musical signs, coins, the symbols of the Roman Catholic Church, as the sign of the cross, etc.

Under this conception Finkelnburg also included failure to recognize places and persons. Wernicke adopted to a certain extent his views and elaborated the conceptions of asymboly to mean the loss of the memory pictures of an object. The symptom complex as understood by Wernicke corresponds to our present-day agnosia, a terminology first suggested by Freud.

Meynert was in accord with Wernicke's opinion and his sensory asymboly corresponded to the latter's ideas. Heilbronner some years back employed the term asymboly as synonymous with agnosia. Meynert's motor asymboly corresponding to Nothnagel's (Seelenlähmung) is practically identical with Liepmann's present kinetic apraxia, to be described later.

Although Allen Starr was one of the first to employ the term apraxia, yet he did not use it in the same sense as we understand the disorder to-day, for his cases referred to were really agnosias and the term of apraxia in its narrower sense was not evolved inability to recognize the object touched. The recognition remains unimpaired in proportion to the measure of the remaining sensibility. However, one sometimes sees in typical cases of tactile agnosia slight disturbances of sensibility entirely destroying the faculty of recognition. Efforts have been made to differentiate tactile agnosia and astereognosia by the latter of which we infer an inability to recognize objects by form. The agnosic, for instance, may handle an object, appreciate that it is sharp, round, square, cold, light, smooth, etc., the primary sense perception being unimpaired, but the complex idea is not sufficiently complete to produce the recognition of the object. In astereognosia, on the other hand, theoretically speaking, the patient may appreciate weight, temperature, consistency, etc., yet have no recognition of the object from his failure to appreciate its forms. Heilbronner[7] has not as yet seen a case of tactile agnosia (continued paralysis of touch) where the ability to recognize the wooden bodies introduced into the hand was entirely undisturbed. Thus it will be seen that from the theoretical and practical sides of the situation, differences occur and as a result some confusion exists regarding the definition of tactile agnosia; and it has not been made clear whether astereognosia should be regarded as a separate entity or as synonymous with the disorder.

Tactile agnosia limited to one hand, disregarding the difficulties of distinguishing the same from sensory disturbance, presents a well characterized picture and one not easily confused with agnosic symptoms from other quarters. It is not absolute in all cases, and here and there one sees a case where among a number of objects the patient is able to recognize a single one, and not always the one which presents the most perceptible tactile signs (Heilbronner). On the other hand, one sees, in a long-continued examination that from the influence of fatigue the results for the affected hand alone deteriorate.

Visual agnosias, free from complication with other agnosic phenomena, are also frequent in the literature; isolated auditory agnosias, however, are more rare, and the literature concerning them is deficient. The optic as well as the tactile agnosias will, perhaps, permit of two classifications: those in which at least elementary recognition is shown through the ability to recognize again objects which had once been presented; and those in which this ability is lacking.

SYMPTOMATOLOGY OF APRAXIA

For convenience of expression, in the present day the term apraxia is alone employed where there is inferred a disturbance on the motor side of the sensori-motor arc and on the motor side alone. Here it must be understood that the individual fails to carry out some subjective purposive movement or movement-complex, notwithstanding his appreciation of what is required of him, and the absence of sensory disturbances, motor or coördination defects.

To avoid threatened confusion from the various names appearing in the literature as regards the apraxia situation, Liepmann[18] was led to make the following classification:

I. Limb-kinesthetic apraxia (Gliedkinaesthetisch Apraxia).

Loss of the purely kinesthetic memories of a member. The patient is unable to carry out any specific act correctly without the aid of vision; for example, cannot point his index finger without seeing his movements, as he has to depend on his visual memories for the accomplishment of the act. There may be marked inertia; the affected limb is never voluntarily moved, he avoids all use of it and it is never brought into action unless he is required to do so. This condition has been referred to as paralysis of the will. Kinesthetic or kinetic apraxia is practically identical with Meynert's motor asymboly (by which was embodied something ideative and kinetic in the concept of the use of the object), and Heilbronner's cortical motor apraxia.

According to Liepmann the disturbance is probably located in the cortex of the central convolution.

II. Ideo-kinetic apraxia or pure motor apraxia.

Here the limb-kinesthetic memories are preserved but dissociated from the ideative general outline of the motion. Ideational processes and kinesthetic memories are severed (thus the hyphen between ideo and kinetic).

Heilbronner would call it transcortical apraxia.

III. Ideatory or Ideational Apraxia. (Pick's ideo-motor form.)

Limb-kinesthetic memories are intact, also the connection with the ideational outline, but the latter itself is at fault or deficient. It was until recently said to be conditioned by diffuse lesions in the brain.

It goes without saying that here as in classifications of all natural phenomena it is only rarely that a symptom picture in reality represents a single one of these types and in a great majority of cases one can only speak of a greater predominance of one of these forms of abnormal reaction.

The limb-kinesthetic apraxia (Gliedkinaesthetisch Apraxia) of Liepmann affects either the extremities of both sides or only of the right or of the left side. There is further a bilateral limb-kinesthetic apraxia of the muscles of the face, the tongue and the jaw, as well as of the trunk motions. Liepmann's ideokinetic form of pure motor apraxia may appear as a bilateral disturbance of motion in the extremities in which the disturbance of motion of the right extremities predominates to a great degree. More frequently, however, the motor apraxia of the type of Liepmann occurs as a pure disturbance of the left side. There is also a bilateral apraxia of the type of Liepmann in the face, tongue, jaw and eye muscles.

The ideational apraxia is usually bilateral, especially noticed in the arms. It should be here noted that in those patients described as having motor apraxia of Liepmann's type, ideational apractic disturbances are often observed, so then it becomes apparent that the relation between ideational and motor apraxia is very close.

To present a somewhat different side to the classification of apraxic disturbances, a correlation according to muscle groups is of importance and thus we have the following (Kleist):

I. Apraxias of the extremities of both sides. Frequently here predominate the disturbances of motion of the right members.
II. Apraxias of the right extremities.
III. Apraxias of the left extremities.
IV. Apraxias of the whole body with preference for the muscles of the trunk, the proximal portions of the extremities, of the face, tongue and jaw muscles and of the muscles of speech.
V. Apraxias in the region of the face, jaw and tongue muscles.
VI. Apraxias of the eye muscles.
VII. Apraxias of the motions of speech, which would include the various forms of motor aphasia, the paraphasias and the disturbances in finding words.

The phenomena which we are about to discuss, even in their widest sense, are met with in the study of many aphasics, hemiplegics, arterio-sclerotics, senile dements, toxic and epileptic confusional states and cerebral tumors; and one observes from the simplest inability to protrude the tongue or close the eyes upon request, to the most complicated distortions of movement of the extremities when a certain action is desired.

Apraxia is peculiarly transient with daily and hourly fluctuations. Phenomena which may be pronounced at one examination may be practically absent a few hours later. Even during an examination many of the motions, previously impossible of performance, may be learned, but only for a brief time. The patient's results vary constantly; often when the accomplishment of the desired act seems hopeless—after a pause—a revelation seems to come to him, and suddenly the task proceeds faultlessly. And yet, a moment later, when asked to repeat the same action, the patient encounters the same difficulties and he may give up in despair.

Generally speaking, apraxics are conscious of their mistakes and express the greatest irritation when they are unable to succeed, but quite frequently they may be unaware that they have erred in carrying out commands, even in tests where they are not blind-folded.

However varying are the faulty motions in performing tasks, a certain classification is possible, and Heilbronner treats of the deficiencies, deformations, confusions and substitutions of motion.

Deficiencies of Motion.—The condition which Nothnagel called soul paralysis (Seelenlähmung) cannot be referred to paralysis or paresis and, as noted above under kinetic apraxia, consists in an inability without the aid of vision to carry out any specific act. A phenomenon closely allied to this condition is a diminished spontaneity of the apractic extremity, especially if the disturbance is unilateral. Here the objection of a failure to understand the command is not applicable, because the intact extremity carries out the order without hesitation. The apraxic extremity requires a special incentive, repeated remembrances and apparently a special determination on the part of the patient. Heilbronner[7] compares the disturbance in the affected limb to the clumsiness in one handling a complicated tool for the first time.

Heilbronner also speaks of this diminished spontaneity, calling attention to its peculiarities. Closely allied here is the condition met with rather frequently when patients handle objects sometimes in a skillful manner but almost never arrive at the point of laying them aside spontaneously, yet they are quite capable of relinquishing their grasp upon request. The most extreme degrees of deficiency of initiative are met with at times in those cases in which positions which are passively communicated are preserved, so that pictures are presented resembling catatonic states. This lack of initiative, which appears to be a volitional defect, may be general and the patient moves about or walks only when required to. Certain exceptions are to be noted in this connection, as for example: Liepmann's unilateral apractic favored in use, especially when left to himself, the apractic right extremity.

Deformations of Motion.—(Amorphous motions.) These are usually not observed where the simplest movements are necessary, such as closing the fist, etc., but are characteristically demonstrated where complex motor acts are required without the aid of objects. They are rarest in motions with objects and are shown most typically in performances requiring special technic. For instance, the patient is told to imitate sawing wood, driving a nail, crocheting, etc. Here the act may be begun simply enough with aimless movements of the hands, spreading of the fingers, but the further he proceeds, the more grotesque are his movements and at last there are peculiar writhings, jerkings and marked distortions of the limbs. Although deformations of motion are rarest in motions with objects, yet patients sometimes with keys, etc., make just as grotesque movements. The phenomena have been aptly referred to as "grimaces of the extremities." Very often quite interesting disturbances show themselves if the patient is told to perform consecutively actions which are similar, for example: beckoning, then threatening or turning the handle of a home coffee grinder and then that of a street piano. An uncertainty shows itself as soon as he is required to repeat the act, and the movements, first uncertain, soon become quite awkward. They experience at times great difficulties when carrying out imitative movements and the mistakes may vary according to whether the patient has to imitate passively communicated positions of the one hand with the other, or motions of the examiner.

The examiner's position in regard to the patient has a special influence on the result and motions which cannot be imitated when the examiner stands in front may be performed correctly when the two stand side by side. Abraham[1] reports a case (with dyspractic disturbances in the left hand and marked disorders in the right). The man at times could carry out an order correctly with the right hand but only after he had performed the same movements with the left. Important also are the results differing in open and blindfolded eyes.

Confusion of Motions.—This disturbance is often difficult to differentiate from deformations of motions. The former are more commonly referred to as perseverations, consisting in a persistence of certain impressions or the repetition of a previously made or required motion, in place of the one desired at the time. The patient may not only repeat in one test a motion he performed correctly in the previous one, but he may repeatedly in a series of tests performed incorrectly make some distinct purposive movement which he had not been asked to do.

The form of perseveration heretofore referred to is also spoken of as clonic perseveration in contradistinction to tonic perseveration (Halftenbleiben), a phenomenon Liepmann holds is due to persistence of innervation and is met with quite frequently. Here patients are frequently unable to relinquish their grasp upon an object. Goldstein[5] reports a woman who demonstrated tonic perseveration quite markedly in her left hand, which at times grasped her throat and choked her severely. It is also demonstrated in a case under my observation, an aphasic with right hemiplegia, the muscular power in the arm having to a great extent returned. At times when the right hand grasps objects he is only able to open it and release the article by tearing away the fingers by force with the left hand. He is greatly annoyed at times when accidentally the hand grasps ends of his necktie or the lapel of his coat. Being formerly an architect, he still draws with a certain amount of cleverness with the slightly dyspractic left hand and to prevent the interference of the right with his architectural drawings, he has it strapped to a palmar splint, for otherwise it would take hold of ruler, dividers, etc., and cause him great inconvenience.

Another type of motions quite similar to confusion of motions are sometimes met with, substitution of actions predominating, as for example the appearance of some movement of a first exercise in a second. Actions are produced which thoroughly agree with the previously described distorted motions. Another type of substitution of motions is presented when the patient, intent upon a certain motion, slides off in another direction "off the rails," which in nature and direction is similar.

Regarding the disturbances of the muscles of the trunk, an account has been given by several authors, who cite cases where the patient is unable to turn in bed or bend sidewise.

Apractic disturbances of the lower extremities do not appear commonly in the literature. Heilbronner refers to a unilateral case. There was sufficient power for the separate motions of walking but the person was not able in spite of this to use the leg for walking upon the first attempt.

Quite interesting are the apractic disorders in dressing and undressing. Abraham's patient encountered great difficulties in eating, on account of which there is inability at times to partake of a meal without assistance.

Of late, without entering too much into details, as such a lengthy examination would require a description of agraphia from the aphasic standpoint, the writing disturbances in apractics have been termed apractic agraphia. Sometimes the agraphic disturbances predominate in individuals to such a degree that they seem to be the only symptom evident. In other cases they are subordinate to the other disturbances, without there being always an analogous explanation for this conduct, such as was offered in a case of Liepmann,* where a one-sided apractic with the extremely apractic right hand wrote even "elegant" letters. In the pure forms of apractic agraphia of the motor type, the idea of the forms of letters of the alphabet is intact and only the carrying over, or the transmission to the motorium is broken. The patient is unable to produce a letter of the alphabet; he can copy just as little as he can write spontaneously or from dictation. At the same time the recognition of letters (the reading of letters) is intact. In exceptional cases it has been observed that copying succeeds while spontaneous writing is entirely impossible; more frequently one notes that the copying of simple forms is still successful while the copying of writing is entirely impossible. Again just the opposite may be seen; at least the rudimentary capability of copying letters in writing with the apractic hand with almost complete inability to draw the simplest figures from a copy.

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* Quoted by Heilbronner.

Ochs, a right hemiplegic, reported by Leipmann and Maas, spoke and read with fair correctness, but was dyspractic and markedly agraphic in the left hand. The authors were of the opinion that the agraphia could be regarded as one of the manifestations of the apraxia. In contrast to this case Liepmann's councillor is interesting, apractic on the right side, clumsy in the performance of many movements with the left and considered to be to a certain extent ambidextrous. With the left hand he performed "mirror writing." The councillor possessed the advantage over Ochs (a carpenter) in being well educated and having spent a life time with the pen. In being to a certain extent ambidextrous, his relatively independent right hemisphere is shown.

HYPOTHESIS ON ACTION DERIVED FROM VARIOUS CLINICAL AND PATHOLOGICAL STUDIES

So much has been said relative to motion in apraxic phenomena that it would be wise to refer in detail to the part that action plays in the subject with which we are dealing, especially to its importance in the explanation of agnosia and motor apraxia through inhibition of definite direct tracts between sensory and motor fields. Whether the supposition that such a direct path is necessary and justified Goldstein[5] discusses quite worthily in his theory of action.

He abstains from considering simple reflex action in which the direct connection between sensory and motor fields suffices without interference of will or consciousness. Closely allied to the reflexes are those motor expressions which arise by way of a cerebral short circuit and are designated as "individual capacities" (Eigenleistungen) of the senso-motorium. The term "individual capacities" is a rather clumsy expression and hardly suited as a translation of the German "Eigenleistungen," for which in English we have no word that exactly corresponds to or conveys the proper meaning of the expression. Therefore, the original German will hereafter be employed in this paper when reference is made to these phenomena so closely allied to the reflexes. Quite like the reflexes, the Eigenleistungen promptly discharge on sensory stimulation and they show as well their relative independence from the psyche,—so that they may follow sensory stimulation even when their voluntary stimulation is not possible. They were demonstrated in Goldstein's case when the woman frequently wiped her face, rubbed her eyes, etc.; and in Liepmann's councillor in buttoning and unbuttoning his clothes; they are also evident in the patient described below and will be referred to later. These movements have been developed by extremely frequent repetition, and are discharged without conscious activity of the patient. The interference of the will rather acts in a disturbing manner on their execution, and in this way they differ from the simple reflexes, which the individual can only retard or check in slight measure. Furthermore, whereas for the simple reflexes the motor result follows immediately upon the sensory stimulation, a certain intention to move in some way on the part of the individual is necessary for the production of the "Eigenleistungen." When this intention to move exists the rest follows after the manner of a reflex. Furthermore, the individual is not compelled to carry out the movement as in the reflex. The movement may even appear to be independent of the will, but a certain volition exists, nevertheless. A simple sensory stimulation will suffice for their production without consciousness materially entering into the situation. In other words, they are automatisms, and have, by frequent practice, become simplified and rendered mechanical.

A similar anatomic basis for these "Eigenleistungen" as for the reflexes may be accepted, a senso-motor short circuit probably acting only as a side conduit, while another path may be considered as their main conduit; the same which lies at the base of all movements. The assumption of this main conduit becomes necessary because the "Eigenleistungen" may be and frequently are, executed voluntarily, since they owe their existence to acts of pronounced volition; in other words, they have been learned. The side conduit is only a secondary product of practice in the individual. The main conduit, which we will now describe, proceeds not by direct transmission of stimulus to reaction but through the influence of conception. This is understood when we consider, for instance, what happens within us when we execute any motion in response to sensory stimulation. When we imitate a motion, the seen motion is a perception. Among the various components of this perception that of space concerns us here at present. The space component, we may say, is embodied in every perception, and it is of the greatest importance that it be always the same for the same purpose, no matter by what sensory organ it is conveyed to us. Goldstein gives an illustration of this. For instance, the circle which we see must produce the same space conception as that originating by one's finger, passively guided, or that awakened in us when the word circle is heard, etc. This identity of the space idea designating in a completely independent manner of these sensorial factors taking part in the perception, presupposes that it is elaborated in a part of the cortex wholly different from that in which the sensory fields lie, a part designated as the stereopsychic field. Therefore, the stimulations of the stereopsyche, reaching our consciousness as space conception, become later the starting point of the individual voluntary movement.

At first the seen motion need only awaken the conception of simple form and the form conception has no relation to any definite member of the body. We do not gain at first an idea of the definite individual movement until the conception of the individual limb to be moved is united with it. Therefore, the special representation of a definite motion by a particular member contains also a certain mental or psychic residual just as the memory image of every perception contains besides the spacial factor a psychic residual. These psychic residuals are the remnants of former similar movements awakened in us by our attention being directed to any motion to be executed by a definite muscular group. As a matter of fact these residuals must be of essential importance for the synthesis of the abstract conception of movement and the movement of the particular limb in itself. Just as the abstract conception of a movement as to space occupied is a production of the stereopsychic field, so we must think of the conception of a particular member as a function of the same. It is a stereopsychic stimulation which ends in the motor cells of the cortex, thus producing the movement, but which naturally must not be thought of as localized on one side. Like every other conception it is the product of the entire stereopsychic field. If the stereopsychic stimulation reaches a certain height and enters our consciousness as the will to move, a stimulation of the motor cells sets in and as a result we have actual motion.

When we analyze psychologically the mechanism of the imitation of a simple movement, we find that even in this relatively simple process there exists a certain amount of complication. The first act which takes place is a visual sensation of the movement to be imitated. Now we cannot speak here of a direct transmission of this sensory stimulus (visual sensation) to our motility as the stimulus only reaches the motorium after having originated a conception of the movement. Furthermore, we do not comprehend at first all the individual acts of the seen motion but essentially only the result of the movement and this conception of the movement is only awakened in us in a general way while the execution of the finer details of the imitated movement proceeds by the mechanism of imitation, i. e., aided by previous memory images. There is no direct connection between each individual act of the motion we watch and the movement executed by us. This explains why we only imperfectly imitate movements with which we are unfamiliar. The conditions during the imitation of passive movements, that is, during the stimulation of kinesthetic perceptions, are not essentially different. Here also no direct transfer takes place, though the procedure is probably a simpler one. Certainly every more difficult kinesthetic imitation (especially unfamiliar) has to pass by way of the conceptions over to the stereopsychic field. This is apparent from the fact that the movement made in imitation does not exactly correspond to the original movement.

On the whole, we find the same in every stimulation of motor reaction through sensory stimulation,—always the necessity of an intermediate area between the sensorium and the motorium, which contains psychic value whereby it differs in principle from the motorium as well as the sensorium.

Goldstein does not gainsay this idea by the fact that usually a large number of quite complicated motions are actually executed unconsciously,—for example, the correct making of two series of motions side by side, only one of which has any conscious value. In all these motions, even when they are made unconsciously, a direct transmission from the sensorium to the motorium does not take place, as we see from the observation of the cases of apraxia in which the intermediary link, which reaches our consciousness as conception, is affected. Thus, in these cases the movements are no longer carried out as promptly or as well as in normal individuals with unaffected intermediary links (conceptive element).

The stereopsyche is the organ of engrams (memory pictures), for these exist essentially in representations implying space,—an essential part of the process of recognition of objects takes place in it, for in the stereopsyche various sensory components of an object are united into a single complex conception of an object by the single representation implying space. Motions of handling objects proceed from the stereopsychic. It is thus the central organ of all recognition, of all higher activity, of all voluntary motion. The ideative sketch of the actions is created in the stereopsyche, and its close relationship to ideational apraxia is apparent. Action, as a matter of principle, is nothing more than simple motion, only the complexity, the definite union of a large number of individual motions, make it an entity.

The lesions of the connections of the stereopsyche with the sensory and with the motor centers call forth characteristic disturbances; the former producing the various agnosias,—the latter, motoric apraxia.

Localization of Apraxia

Among the first facts gained for the theory of localization was the importance of the left hemisphere in aphasic disturbances in right handed persons, the right hemisphere taking its place in left handed individuals, and it is now generally recognized that for apractic and agnosic disorders as well, the left hemisphere predominates as the seat of the lesion, which produces at the same time a paralysis of the right side. Furthermore, apraxia is either due to a cortical or subcortical lesion and is always supracapsular in origin and a sign which proves this, according to Liepmann, is the presence of aphasia. Although it has become an established fact that left-sided lesions alone most frequently accompany apractic phenomena, there has been some diversity of opinion relative to the area in the left hemisphere which occasions apraxia and the literature upon the subject is still in quite a fluent state. Yet in the last year or two, although diagnoses are still made with some caution, less conservativism has been shown than formerly and the left central convolution, supramarginal gyrus, the frontal lobes and the corpus callosum through its connections with them, have become the elective areas upon which attention has been entirely directed in localizing apractic phenomena. Von Monakow[16] who objected to the custom of associating the chief clinical symptoms with the chief pathological lesion has met with some opposition, especially in his hypothesis of "Diaschisis," by which he infers a shocklike inhibition of function caused by an acute focal lesion but appearing primarily in uninjured parts of the brain, distant from but anatomically connected with the focus. He alleges that the supposed compensation which afterward results would be effective through cessation of the diaschisis. Von Monakow's theories as regards "Diaschisis," it might be noted, have not met with approbation by his fellow colleagues.

Heilbronner[7] holds that all motions which result in speech, including motions of expression, and all motions of the left hand are governed by a center common to both extremities in the left hemisphere. Liepmann proved that this was true to a most extreme measure for all motions without purpose and to a limited degree for the manipulation of objects, as all these performances were distorted by affections of the left hemisphere. Here it is alleged are deposited the engrams (memory images) of motion, and in consequence a left-sided lesion would produce the apraxia in question. As a matter of fact, Liepmann believes that the whole of that which one must understand under the "idea" of motion is almost never destroyed and, therefore, in those cases in which the memory for motions is impaired, they are usually only partial memories or kinesthetic memories which are absent. For his explanation of the left-sided apraxia Liepmann did not think it important to alone seek for disturbed memory centers but that most of these phenomena indicated that something else played a part and thus he directed his attention further to explain apractic phenomena and in consequence evolved two possibilities:

(*a*) That the region in question could be situated above Broca's convolution and considered the neighboring middle and upper temporal convolutions as a district which served for the transportation of ideas of direction into innervation and for crystallization into a complex with a purpose.

(*b*) A simple and more probable theory that the arm center in the right brain and, therefore, that for the left hand remains permanently dependent on the left center, which through the fibers of the corpus callosum is the guide of the right center.

Liepmann[18] further offered the five following postulates upon the localization of apraxia:

1. A lesion of the left arm center produces a more or less pronounced paralysis of the right arm and the left deprived of its guidance becomes dyspraxic. (By dyspraxia is inferred that certain purposive movements succeed while others fail.)

2. A subcortical lesion of the central convolution interrupts the projection fibers to the right hand as well as the callosal fibers to the right hemisphere and, therefore, produces a paralysis of the right and dyspraxia of the left hand. (With this view in reference to the importance of subcortical lesions in the central convolutions von Monakow and Heilbronner agree.)

3. If the lesion affects the internal capsule where the projection fibers are sharply separated from the commissural there is produced only paralysis of the right hand without dyspraxia of the left.

4. A lesion of particular size and position which attacks only the corpus callosum would produce a left-sided apraxia by depriving the right hand center of the guidance of the left, while the right hand need be neither paralyzed nor apractic. Quite similar results would follow a lesion attacking the callosal fibers in the left hemisphere where they are separated from the white matter.

5. Liepmann's fifth possibility is that a lesion situated in the white matter of the right frontal lobe may cut across the path of the fibers passing from the left frontal lobe, via the corpus callosum to the right arm center in the right hemisphere without injuring the projection fibers from that arm center to the left hand. Therefore, we would have a left dyspraxia from a right frontal lobe lesion.

Localization of Left-sided Apraxia.—Those cases of dyspraxia of the left side accompanying paralysis of the right are so frequent and the anatomical findings exhibiting left-sided lesion are so constant that a further discussion concerning them is hardly necessary. Certainly the number of cases presenting this symptom picture and at the same time subcortical foci, in the left central convolution, demonstrates the importance of this area in the left hemisphere in apraxia.

Left-sided apraxia appearing alone without paralysis may also be conditioned, as above stated, under Liepmann's fifth postulate, by a right-sided frontal brain lesion, which cuts across the path of the fibers, passing from the left frontal lobe through the corpus callosum to the right arm center in the right hemisphere without injuring the projection fibers of that center to the left hand. Hartmann's Case 3, which probably falls under this category, is as follows:

The patient's right arm was normal, the left markedly apractic, exhibiting amorphous movements or there was little motion at all. In handling objects the right side was normal, the left being akinetic. With both hands together in demonstrating the use of objects he was correct. He also presented apractic disturbances of the face, was unable to grimace and could not perform certain movements with his tongue. Anatomically was found a cyst of the middle of the right frontal lobe, not involving the lateral ventricle. Broca's area as well as the central convolutions were left free.

From this third case Hartmann deduced the opinion that impulses from the various sensory systems of both sides rendered possible the running off of a spontaneous series of motions fitted to a purpose in the right brain. The continuation of the action with the help of memory requires the assistance of the left frontal brain. Kleist does not see the possibility, however, of deciding whether the apractic disturbances in this case were conditioned by injury of the right frontal lobe or in part by injury of the corpus callosum fibers leading to that area, as the impulses necessary for the performances in question must be conducted from the left to the right hemisphere by means of the corpus callosum.

Again where we find left-sided apraxia alone the importance of the corpus callosum must be borne in mind and we have seen from Liepmann's fourth postulate that a lesion so situated can occasion a left-sided apraxia without parlysis or apraxia on the right side. Van Vleuten's[28] very instructive case illustrating this postulate is here given:

The patient before coming under Van Vleuten's observation was thought to be a paretic. There was a slight aphasia consisting of a difficulty in finding words and occasionally paraphasic utterances but there was neither word deafness nor word blindness; there was no evident paralysis or paresis. The right hand and foot presented "tone perseveration," and there was a general tremulousness on this side increasing with muscular effort. These disturbances interfered to a certain extent with the execution of various movements with the limb, but otherwise the right side was eupraxic.* The left upper extremity was markedly apraxic. Anatomically, a large sarcoma was found in the white matter of the left hemisphere, involving the whole of the left half of the corpus callosum and part of the right genu of the same. The cortex of the left frontal convolutions was intact.

To illustrate further the role played by the corpus callosum in left-sided apraxia, we have Hartmann's Case 2, as follows:

The patient presented neither paralysis nor sensory disturbance; there was marked difference in the performance of motion of the two sides. Movements by the right hand were executed correctly but slowly with the aid of vision, but with closed eyes there was almost akinesis. The left hand was almost completely apractic. With both hands together in motion for some object he was hopelessly apractic. Movements conditioned by auditory stimuli alone or motions from memory, he was unable to carry out at all with the left and very few with the right hand. Anatomically, there was found a tumor of the corpus callosum extending along the mesial surface of the left hemisphere up to the calcarine fissure.

Once again, Goldstein's[6] case in which after disappearance of a left-sided paralysis there appeared a left-sided apraxia emphasizes in this type of disturbance the importance of the corpus callosum as anatomically it was found almost completely destroyed.

Lesions Found in Right-sided Apraxia.—Liepmann's original case of apraxia, through the wonderful technic of this investigator, served to be the incentive for the detailed analysis of apractics thereafter. The patient previously referred to as the "councillor" before coming under Liepmann's observation was thought to be suffering from aphasia and post-apoplectic dementia. He presented weakness of the left side of the face, unequal pupils and weakness of the left leg, but no real paralysis of any of the limbs. There was motor aphasia and some alexia, but no word deafness, mind blindness or hemianopsia. There was a marked disorder of the stereognostic sense and a slight hemianesthesia of the left hand. Orientation, memory and attention were normal. After a careful study there was demonstrated typical right-sided motor apraxia with bilateral apraxia of the head, neck and face.

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* The normal state.

The apraxia of writing was noted previously. Anatomically, it was found that the whole of the corpus callosum was softened with the exception of the splenium. In the left hemisphere there were softenings in the white matter underneath the first and second frontal convolutions. In addition there was a large subcortical cyst beginning under the lower third of the post central gyrus and spreading backward through the parietal lobe beneath the supramarginal gyrus to end at the posterior part of the angular gyrus.

In connection with the supramarginal gyrus, quite recent[10] evidence supports the view that it is the indispensable place for the origination of motor apraxia, at least of the extremities of the right side, but it is questioned if the injury of the left gyrus supramarginalis can alone call forth apraxia or if there is another area in the brain which must be injured at the same time. Kleist is of the opinion, however, that the disease of this gyrus may alone cause apraxia, at least of the right extremities.

Hartmann through his frontal lobe theories gives evidence to prove that a right-sided apraxia can be conditioned by lesion of the left frontal lobe together with interruption of connections in the corpus callosum. His Case 1, given as follows, demonstrates this theory:

The patient showed a grave impoverishment of spontaneous motions; a retardation of all processes of motion produced by sensory stimulus. Complicated actions in motions of the upper extremities were exclusively performed on the left side and here not normally. In the right field of vision the patient's reaction appeared to be that of a hemianopic. A condition similar to cortical deafness was likewise present on this side. On the left side objects and motions exhibited before him were properly recognized and there was a prompt reaction to noises and understanding of words spoken. On the left side the sense of touch was not disturbed and there was no tactile agnosia. On the right side objects could not be recognized or named. The simple imitation with the left extremities of motions passively communicated to the right succeeded very promptly. Those communicated to the left were tardily performed by the right. As the case progressed the spontaneous progress of motion became extraordinarily impoverished in all fields, so that patient usually laid for hours motionless on his back with closed eyes. Imitation of motions made before the patient, which were previously well performed on the left, no longer followed. He responded best of all to invitation to general locomotion of the whole body (walking, standing, turning around, etc.). He had no appreciation of his mistakes in movement. The anatomical findings revealed a tumor of the left frontal region which very probably originated from the left half of the anterior part of the corpus callosum, destroying its knee. The fibers of the internal capsule were not injured. In both halves of the brain the cortex of Broca's region and the anterior and posterior central convolutions were spared.

Lesions in Bilateral Motor Apraxia.—Kleist assumes that the engrams of the separate actions and of the sequences of actions, etc., are not contained exclusively in the left hemisphere but that in both hemispheres the gyrus supramarginalis, the central convolutions, and the frontal lobes are differentiated but in such a way that these territories are more highly developed in the left than in the right hemisphere. Therefore, the right hemisphere is thrown upon the support and guidance of the left. To these ideas Liepmann[18] has already called attention. The cases of right-sided apraxia with accompanying left-sided dyspraxia and the cases of exclusively left-sided apraxia render it fully certain that in the majority of individuals the memory images of actions in the right hemisphere require support from those in the left hemisphere. However, according to Kleist the problem is left unsolved how this coöperation of the right hemisphere which receives support from that in the left is carried out. That the eupraxia or normal functional activity of the left side depends upon an intact condition of the commissural fibers which form the middle third of the corpus callosum is borne out by some of the cases reported in the literature. Several right sided apractics, who aside from their disturbances of the right side, also showed distinct apractic signs of the left side, the left sided involvement not having been entirely due to a disturbance of the engrams of the left supramarginal gyrus, but also to lesions of the corpus callosum, inasmuch as the middle portion of the latter structure is formed by the fibers of the central convolutions and supramarginal gyrus, which after taking a crosswise course pass inward. To come to the finer points of localization, although there is strong evidence in its favor, it is not considered as certain if the disturbance of the left gyrus supramarginalis is alone sufficient to produce with right-sided apraxia also left apraxia or dyspraxia.

There is also evidence to show that a bilateral apraxia may be produced by a lesion in the left corona radiata in the following manner: This state of affairs is produced by a lesion in the corona radiata just where its fibers divide into two bundles, one portion becoming continuous with those of the corpus callosum and crossing to the right hemisphere, the other bundle passing downward into the internal capsule. If the original disturbance in this location was a slight hemorrhage from the edema surrounding it a transient right-sided paralysis would result, to clear up in a day or so as the edema subsides, leaving the focus which produces a right-sided apraxia and a dyspraxia of the left side.

Lesions of Apraxias of the Head and Face Muscles.—Little can be said that is definite upon this subject and the opinions relative to unilateral or bilateral lesions producing these disturbances are somewhat at variance. Liepmann's councillor, who we remember presented bilateral apraxia of the head, neck and face, was found to be somewhat unsatisfactory from a pathological standpoint at autopsy, as we have noted above, and the anatomical findings revealed a softening of the whole of the corpus callosum with the exception of the splenium. Further, there were lesions in the left frontal and parietal lobes. Hartmann's Case 3 had apraxia of the face with a lesion of the right frontal lobe. In Kroll's Case 2 referred to by Kleist it is possible that the injury of the radiations of the corpus callosum to the right central convolutions had a share in the apraxia of the face. Other cases are mentioned in the literature where apractic disturbances in the muscles of the face were connected with interruptions in the corpus callosum. Kleist is of the opinion that in the bilateral motions of the face, tongue and maxillary muscles both hemispheres work conjointly, so that injuries of the left as well as of the right half of the brain may produce apraxia of the muscles in question.

Lesions Occasioning Ideational Apraxia.—Since the disturbances in the motion sequences (motion formulas) are almost entirely shown in actions performed by both hands (with objects that are manipulated) it at first seems probable that both hemispheres have a share in the engrams of the motion sequences. It is apparent then that only lesions affecting both sides could produce ideational apraxia. If one considers, however, the experience with patients suffering from sympathetic left-sided apraxia, Kleist says we can nevertheless mark the boundaries for the brain part connected with ideational apraxia, formerly thought to be only associated with bilateral and extensive lesions. Interruptions of the corpus callosum and the left-sided lesions of undefined localization have a few times produced a sympathetic apraxia of the left hand in which the disturbance of the motion sequences was contained. There follows, however, further therefrom that disease of both sides of the brain need not exist in the case of bilateral apraxia, which is principally characterized by disturbances of motion. Then, however, with the case of bilateral ideatory apraxia the share of the left hand in the ideational apractic faults must be referred to disease of the left hemisphere or to this and a lesion of the corpus callosum at the same time. If, however, a left-sided lesion can cause a sympathetic ideational apraxia of the left hand, then it would be absurd not to refer this share of the right hand in a bilateral ideational apraxia to the lesion of the left hemisphere. Thus Kleist is inclined to the opinion that bilateral ideational apraxia could originate from a lesion of the left hemisphere in contradistinction to views formerly held that it was occasioned by a general process of the brain. To support his views he compares the clinical histories with the anatomical findings of cases of Liepmann, Manheim, Pick and of his own.

Concerning Akinetic Phenomena and "Tonic Perseveration."—Little can be said relative to lesions attending akinetic phenomena but foci in the left frontal brain, according to Kleist, are probably most frequent where these disturbances appear predominantly on the right side. Likewise, where akinesis is more pronounced on the left side lesions in the right hemisphere are more prominent. It has been assumed that the loss of the memory pictures of motion of the separate actions, at least of the extremities of the right side, corresponds with the injury of a territory which extends over the left central convolutions and the gyrus supramarginalis. The more the gyrus supramarginalis alone is affected, the more the apraxia takes the form of Liepmann's type of motor apraxia. The more the central convolutions are affected, the more the apraxia assumes the limb kinetic type.

In reference to "tonic perseveration" little is known concerning its physiological significance; although akinesis and tonic perseveration are often found together, they can exist independently of one another and for the proof of this we have Hartmann's Cases 1 and 2. These patients presented simple akinesis without tonic perseveration.

Concerning Localization of Agnosic Disturbances

As regards agnosic disorders only a few words relative to our knowledge of their localization will be considered in this paper, the purpose of which is only to present the important features of apraxia in its narrowest sense. A certain reference to visual, auditory and tactile agnosia, however, would not be out of place here in view of the case presented below.

As regards visual agnosia or mind blindness, there is much in favor of the assumption that the elementary perception of light and color depends on the intact condition of the calcarine fissure and the relation of this disturbance to the occipital lobes has long been known and recognized. The question will have to be left open for the present as to whether there is a unilateral or bilateral lesion, yet the number of cases of left-sided lesions is not insignificant. Whereas cases of general agnosia would presuppose a combination of the lesions corresponding thereto, and, therefore, bilateral and very extensive.

Word deafness wins a place to itself in localization by evidence to show that it has been produced by a unilateral subcortical lesion of the temporal lobe but what part of the temporal lobe is to be considered especially responsible for the loss of understanding of speech in the narrow sense is, according to Heilbronner, not yet decided upon with certainty.

In reference to paralysis of touch, Heilbronner[7] gives a principle of diagnostic importance, which is as follows: A cortical location for the lesion is more probable when the tactile agnosia (which may perhaps be combined with disturbances of the faculty of determining positions and perception of passive motion) predominates in the individual case over the disturbances of elementary sensibility, especially the feeling of pain.

The question as to the place in the cortex in which it originates has not as yet been decided. Wernicke* in establishing the foundation for the paralysis of touch (tactile agnosia) makes the middle third part of both central convolutions, and especially of the posterior one, responsible for the disturbance. There may also be added that lesions in the region of the parietal lobe are very often accompanied by phenomena of this sort. Heilbronner quoting Bonhoeffer states that disturbances of tactile recognition and of the ability of localization are dependent principally upon the injury of the cortex of the anterior central convolution. While an affection striking somewhat deeper and further back would entail more distinct disturbances of the perception of position and motion. For a definite decision for elucidation of the localization of tactile agnosia further experience is necessary.

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* Quoted by Heilbronner 7,

We have now considered the essential features of apraxia, and there remains a foreword, by way of introduction, to the presentation of the following case of bilateral motor apraxia in an aged man, who at this writing is still living, and although in view of the presence of marked intellectual deterioration widespread cerebral lesions are probable, nevertheless the presence of certain marked focal symptoms should not deter us from a discussion of what possibilities as regards localization such phenomena would lead to.

(To be continued)

A CASE OF HYPOGLOSSAL NUCLEI PARALYSIS

By A. M. Moll, M.B., C.M., L.M. Edin.

SENIOR PHYSICIAN, JOHANNESBURG HOSPITAL

It has been disputed by some authorities, notably Oppenheim, that the hypoglossal nucleus gives fibers to the facial nucleus to supply the orbicularis oris. Oppenheim takes a sceptical attitude and thinks that such an innervation constitutes an individual abnormality. The contrary view is held by Howard Tooth and Purves Stewart. Bruggia-Mattenci described a positive case in 1887. In view of the rarity of such a paralysis the following case demonstrated before the Transvaal Medical Society on December 21 may be of interest:

A man, aged 30, with a specific history came to the hospital in November, 1911. A few days previously he had felt his speech somewhat affected. Swallowing and mastication became embarrassed. In twelve hours these symptoms were greatly increased. There was also some weakness in the legs and an inability to walk. Consciousness was never lost, the case being obviously one of thrombosis. A month later the writer saw him and found his condition as follows: There was difficulty in eating and speaking. He could not whistle and constantly drooled from the mouth. The tongue lay flaccid on the buccal floor. The whole organ had atrophied—wrinkled longitudinally—showed fibrillar tremors and could not be protruded. The faradic responses were much diminished. On stimulating the hypoglossal above and behind the cornu of the hyoid bone, the responses were observed to be equally deficient. The fibrillar movements of the tongue made it difficult to measure exactly the qualitative alterations under galvanism of any given muscle. There was a definite quantitative diminution throughout the whole organ. The point of chief interest was that the orbicularis oris clearly participated in the electrical alterations. There was no affection of the other facial muscles. The ocular muscles were all intact, as were all the remaining cranial nerves. There was no affection of the muscles supplied by the descendens hypoglossi. The pyramidal tracts were, however, implicated. The gait was spastic, the knee jerks much increased, and ankle clonus could be elicited. On iodides and later mercury and iodides marked improvement resulted in two months. The patient now speaks and eats without much difficulty. The tongue is clean and can be protruded beyond the teeth. Drooling has ceased, although his knee jerks are still somewhat exaggerated; the ankle clonus has disappeared. He walks comfortably with a stick. It is justifiable to predict that a greater measure of improvement will ensue in the course of time.

THE OCCURRENCE OF THE SYPHILITIC ORGANISM IN THE BRAIN IN PARESIS

J. W. Moore, M.D.

(From the laboratory of the Central Islip State Hospital)

The object of this paper is to present in a form more interesting to psychiatrists and neurologists the facts regarding the presence of the *Treponema pallidum* in paretic brains.

The subject of the relationship of syphilis to paresis has been so frequently scarified that writers on that topic must needs present something radically new in order not only to secure perusal but to avoid triteness. The whole question has been most comprehensively reviewed by Kraepelin[1] and by Nonne,[2] and yet, of these authors, the one says, "We do well to say no more than that syphilis in many cases weakens the resistance of the brain, so that the later appearing factors may influence it in the sense of producing paresis" (p. 313). The other concludes that "We can to-day declare with the greatest certainty that syphilitic infection is an essential for the later appearance of paresis" (p. 509).

Assuming that the present status of the question is understood by all of us, the writer will not discuss it further, but would call attention to two important hiatuses in the information which we have possessed relative thereto. These points were mentioned in an earlier communication on the subject,[3] which spoke of the necessity first of experimental inoculation of animals (apes or rabbits) with material from brain and organs of paretics to ascertain if such material is pathogenic and if the cell changes of paresis or of syphilis are produced, and, second, of a determined search in the paretic brain for the organism of syphilis.

The first investigation was beyond the possibilities of a limited laboratory equipment (and apparently no one has undertaken the study as yet), but the latter was a much simpler matter, since there were a fairly large number of brains in the possession of the writer from his autopsy service at the Central Islip State Hospital and the method of staining the organisms is not difficult.

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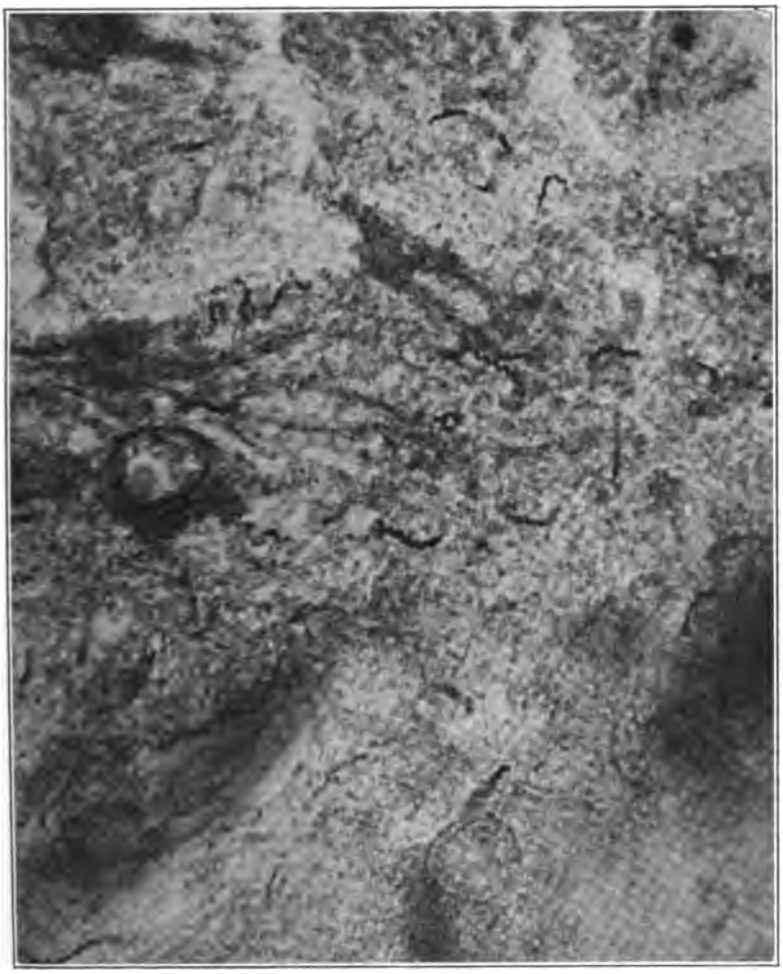
[1] Kraepelin, Psychiatrie, 8th ed.

[2] Nonne, Syphilis und Nervensystem.

[3] Moore, The Syphilis-General Paralysis Question, Rev. of Neurol. and Psychiatry, May, 1910.

It must be mentioned that the work was undertaken more from a sense of duty than with any great hope of success, since the conviction has been constantly present that, for many reasons, paresis must be regarded as quite distinct from syphilis proper—that it is a "metasyphilitic" (Moebius) or "parasyphilitic" (Four-



Treponema pallida in the brain in paresis. Case F. B. (299).

nier) manifestation, brought about perhaps by a general metabolic disorder on a syphilitic basis as held by Kraepelin, or, if due directly to the syphilitic organism, that that organism is in some decidedly altered condition. This view is of course the one held by the majority of psychiatrists. Nevertheless, two very significant facts held out the hope that the organisms did exist in the brain. These are the close clinical and anatomical analogy between syphilis and paresis on the one hand and trypanosomiasis and sleeping sickness on the other, and the almost constantly positive complement-fixation reaction for syphilis in paresis. In sleeping sickness the trypanosome, also a protozoön, has been found in the brain and spinal fluid, therefore it was not unreasonable to believe that the treponema might be found in the paretic brain. The positive serological reaction in paresis should mean the presence of an active organism, since in syphilis this reaction disappears when the infective agent is eliminated spontaneously or by treatment. Plaut has declared his belief in the presence of active syphilitic disease in paresis on this basis.

A brief description of the procedure followed will be given. Blocks of tissue were removed from seventy paretic brains which had been preserved for varying lengths of time up to two years in formalin solution. Most of the pieces were from the frontal region or the gyri recti, the aim being to select the location where the process was most intense so far as evidenced by thickening of the pia and atrophy. These specimens were subjected to the Levaditi silver method of staining in tissues as described in most text-books on pathological technique, but with certain modifications which will not be discussed here and which, in the light of subsequent experience, were probably not important. It is the writer's belief at present that the usual Levaditi technique is satisfactory for the purpose and that the failure to find the organism hitherto is explainable by two principal considerations. First, the stain is capricious and many specimens are unfit for a search for the treponema by reason either of an exaggerated affinity of the neuroglia fibers for the silver or of the granular precipitation of the metal throughout the tissue. It is only, therefore, by examining a considerable number of specimens that the correct degree of effacement of all nerve and neuroglia fibers is happened upon. Even in the best preparations large parts of the section are unavailable. An endeavor to devise a technique which will give inevitable good results has not yet succeeded. The second consideration is the fact that the search has usually been made in the pia and vessel sheaths where the treponema has been repeatedly found in syphilis of the brain, but where the writer has been unable to find it in paresis.

The organisms were first seen by Noguchi of the Rockefeller Institute for Medical Research in a duplicate set of slides lent him by the writer for the purpose of looking for a granular form of the treponema. They have been found altogether in twelve cases and the report was published in the Journal of Experimental Medicine.[4]

The number of cases is too small to admit of an opinion as to a characteristic distribution or localization of the treponema in paresis, but the conditions observed in the twelve cases presented uniformly certain peculiarities which will be described. They were not found in the pia in spite of prolonged searching. In only one instance were they found in the sheaths of the larger vessels; usually they were remote from any vessel of sufficient size to be seen in an ordinary preparation. Their motility and penetrating powers had evidently permitted them to wander into the nervous tissue. In seven cases only one or two organisms were seen; in five they were relatively numerous and very easy to find. In all but one case they were widely scattered and only occasionally were two encountered in a field. In this one case there was a focus in which they were present in large numbers, as many as twenty occurring in a field. This focus was not a gumma. Whatever other histological changes may have been present were not brought out by the Levaditi stain. A large vessel ran through the margin of this area and a few treponema were found in its adventitial sheath but did not give the impression of having arrived by that route. It is from this case that the photomicrograph was made. The great majority of the organisms occurred in the nerve-cell layers of the cortex. None was found in the superficial neuroglia layer and only an occasional one in the marrow. They seemed to bear no relation in numbers to the severity of the paretic process but this probably has no more meaning than the same lack of proportion between number of bacilli and gravity of lesion often seen in tuberculosis.

The diagnosis of paresis was unquestionable in all the cases.

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[4] Noguchi and Moore, Jour. of Exp. Med., Feb. 1, 1913.

They showed the classical physical signs and mental symptoms and were confirmed by autopsy. Brief abstracts of a few of the records follow:

F. B. (299). At the time of entering the hospital he was 58 years of age. He admitted having had syphilis. For a few months before his commitment he had been nervous and forgetful and had complained of numerous bodily ailments, such as that his bowels never moved, that he had not eaten for three weeks, that he had an incurable disease. In the hospital he was depressed and whining, reiterated the same hypochondriacal ideas, would point to some part of his body and say, " See, it's all dead, all gone, there's no hope." He was poorly oriented, memory was very poor for both recent and remote past. Physically he was in fair general condition, the knee jerks were normal, pupils very slow in reaction to light, there was general tremulousness and tremulous, distorted speech. The spinal fluid showed over 200 lymphocytes to a 1/6 field, positive globulin and positive Wassermann (Noguchi) reactions. He deteriorated gradually and after eleven months in the hospital died of bronchopneumonia. The brain showed pronounced paretic changes, both grossly and microscopically.

S. V. (131). A colored man of 37. Syphilis eight years previous. He was admitted in a rather early stage, but showed euphoria, poor memory and orientation. The knee jerks were diminished, pupils slow, speech ataxic, there were coarse tremors. Later he developed typical expansive delusions, became very ataxic and had to be confined to bed. Death after twenty-seven months in the hospital. The brain and cord showed very marked paretic changes. The proliferative changes were much more pronounced in the right hemisphere.

F. M. (169). A man of 55 years. He was picked up on the street in a confused condition and a history was never obtained. He expressed absurd hypochondriacal ideas, " insides falling out, couldn't urinate, couldn't breathe," etc. There were indefinite hallucinations of depressing content. He was disoriented, memory was very poor. The knee jerks were exaggerated, pupils sluggish. There were marked tremors, unsteadiness, Romberg sign. Speech not seriously affected. The spinal fluid showed enormous increase in cells and positive globulin and Wassermann (Noguchi) reactions. Depression continued, he failed rapidly and died after four months in the hospital. The brain showed definite paretic changes, but very little atrophy.

Ten of the cases were men, two were women, seven were of the cerebral type, five tabetic. The age varied from 33 to 60 with an average of 44. The duration in the seven cases in which it could be determined averaged 17 months. The majority were much below the average duration as estimated by various authors, which varies from 24 to 32 months. It is possible then that we are more apt to find the treponema in cases which run a fairly rapid course. Most of the cases admitted syphilis, but in only three was the interval between infection and onset of paresis determined. In these it was 8, 10 and 18 years. It is hardly necessary to say that the possibility of the cases being cerebral syphilis in the narrower sense is definitely excluded. They all showed a diffuse, progressive deterioration in all the mental fields. There were no cranial nerve symptoms or other focal manifestations. However, it is possible for an old syphilitic endarteritic-meningitic condition to be clinically indistinguishable from paresis and the final diagnosis must depend upon the post-mortem findings. Anatomically the brains of all twelve cases showed the usual pial thickening of paresis, more marked over the frontal convexity and diminishing from before backward. In two it was also prominent over gyri recti, cerebellum and cisterna, but did not assume the degree of meningitis usually seen in syphilis of the base. In one there was an old hemorrhagic "membrane" beneath the dura, in another there was a preponderance of the inflammatory reaction in one hemisphere but these conditions were not represented clinically and the findings were otherwise typical. Moderate frontal atrophy was present in most of the cases. Microscopically the meningeal process in all cases was diffuse, being more marked in the frontal region. The vessel infiltration was also diffuse and found at all depths of the cortex and in the marrow. Plasma cells were numerous and usually outnumbered the lymphocytes. Rod cells were always present. The nerve-cell alterations and changes in the neuroglia do not present differential characteristics and will not be enumerated. With regard to the vessels, a number of cases, as in all paresis material, showed endarteritic changes. In six there was definite thickening of the vessel walls of the type described as syphilitic. In no instance did the intimal proliferation embarrass the lumen to any extent. It seems hardly possible that the presence of the treponema could be traced to the luetic endarteritis, since, if this were the case, one would reasonably expect to find them more often in the immediate neighborhood of the larger vessels. In none of the cases were softenings or gummata found, either grossly or microscopically.

With regard to the identification of the organism as the *Treponema pallida,* there seems scarcely room for doubt. They have been pronounced such by Flexner, Noguchi, Dunlap and others. The possibility of their being of another type of treponema will perhaps require cultivation to determine (and this experiment does not seem to be infeasible), but the remoteness of such a contingency is obvious.

The significance of the finding of the syphilitic organism in paresis is apparent. Only a few of the more important questions which it helps to clear up will be mentioned. We are afforded an adequate explanation of the paretic process as it is found in the brain. The widely scattered organisms and their localization, so far as the twelve cases show, correspond satisfactorily with the distribution of that process. The difference between the disease process in cerebral syphilis and that in paresis is rendered more comprehensible. It is not difficult to conceive, in the former, of a localized syphilitic disease in the meninges with or without endarteritis but with the preservation of a protective barrier against invasion of the brain substance, while, in the latter, a generalized spread of the organism is permitted either by the weakening effects of alcohol or heredity or by the predilection of a certain strain of the organism to attack the nervous tissue. In the actual presence of the treponema which, in at least one case, had the appearance of being in an active state, we see the reason for the serological findings in paresis and in their deep location and wide dissemination the inefficacy of antisyphilitic treatment is made clear. How much more satisfactory it is to have a tangible etiology than to labor with theories of metabolic disorder, overproduction of syphilitic antibody, deficiency of lecithin, etc. Paretic seizures can be understood as results of new invasions of the organism rather than that they are due to vague metabolic disorders or cerebral congestion. The leucocytosis which accompanies them agrees with this explanation.

Our position with regard to the syphilis-paresis question, however, remains unchanged in certain respects. Unless the *Treponema pallida* can be shown in all cases of paresis our argument for "no syphilis, no paresis" is not strengthened. We still have no explanation for the long interval of years between syphilitic infection and paresis. That the organism has lain dormant during that time seems to be shown by the case cited by Eichelberg and

Pförtner[5] of a man who, having had syphilis ten years before, gave a negative complement-fixation test of the blood-serum but a year and a half later developed paresis and with it a positive reaction in the blood-serum. For the widespread degenerative changes in the nervous system which seem to have no relation to the chronic inflammatory reaction we must seek elsewhere for a cause than in the presence of the treponema. The question of whether or not paresis is true syphilis is also still open, but the strongest argument against that assumption has been removed.

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[5] Eichelberg and Pförtner, Monatsschrift für Psychiatrie und Neurologie, Bd. XXV, H. 6.

Society Proceedings

PHILADELPHIA NEUROLOGICAL SOCIETY

November 22, 1912

The President, Dr. John H. W. Rhein, in the Chair.

TABES DORSALIS WITHOUT LYMPHOCYTOSIS.

By Tom A. Williams, M.D.

A most instructive case was one in which, although syphilis of thirty years standing had produced the lightning pains of tabes for eleven years, yet no relief had been obtained by thorough specific treatment. The patient had visited Hot Springs on nine different occasions, and had several inunction courses without benefit. He had taken as much as 450 grs. of potassium iodide per day for weeks at a time, and recently had been given salvarsan, which only aggravated the pains; so that for a month he had been unable to work and had not slept without narcotics. There had been doubts concerning the diagnosis. Several Washington physicians called the condition rheumatism, Dr. Osler had thought it neuritis before he left Baltimore, and later Dr. Thayer believed it was tabes. Increase of the pains caused the patient to consult Dr. Dana, who also diagnosed tabes. Other neurologists dissented from this opinion.

There had been no disorder of micturition, no visceral crises unless a rectal ache upon two occasions were such. There had been no girdle sensation or numbness, nor irritation of the nerves of special sense, no vertigo, nor nausea except what was provoked by medicines. There had been no diminution or excess of sexual power, nor any irritability of temper; and his general health had remained good in spite of the intensity of the pains. These occurred in crises sometimes at an interval of months, sometimes as many as a hundred times a day.

He had never dissipated; but he took from three to fifteen drinks of whisky a week, but no beer or other intoxicants. He smoked three pipes and a cigar or two, and drank one cup of strong coffee daily. He considered himself a small eater, but took fish and meat for breakfast, the usual dinner and a milk and biscuit lunch.

Examination showed the motility to be normal, there being no trace of incoördination. The Achilles reflexes were absent, the patellar needed reinforcement, those of the arms were active, the bulbo cavernosus was absent on the right, and diminished on the left. The abdominal were active, more especially the right, while the cremasteric was more active on the left. Of the plantar reflexes, the left showed the normal flexion as did the smaller toes of the right foot; but the right great toe extended slightly on stroking the sole. The vaso-motor reflexes were equal on the two sides; on the thigh, the right exceeded the left, while on the abdomen the response was less on the right side. The pupils reacted fully to light, especially the left. There were no paresthesias. There was hyperesthesia to pinprick of the left chest and right thigh when tested against the left abdomen; also on the right side, in the 5th lumbar and 1st, 2d, 3d and 4th sacral region most in the 3d and 4th segments. On the left side, the diminution was similar, but was less so in the 1st and 2d sacral and 5th lumbar. The sense of deep pain in the Achilles tendon was delayed over 3 seconds; but *when felt, was intense,* much more so than normal. The diapason was everywhere felt, and the sense of attitudes was unimpaired except perhaps in the right foot. The Wassermann reaction was negative. The cerebro-spinal fluid contained 3.5 white cells per centimeter. Of these, 70 per cent. were lymphocytes, 29 per cent. large mononuclears, half per cent. were endothelial cells, of the remainder none were plasma cells. The protein content was very slightly increased.

The systolic blood pressure was 170, the diastolic 95. The pressure was raised by pain and tenderness at once.

Diagnosis.—Without going into detail, two conditions were present; one was incipient tabes dorsalis, the other was vascular hypertension. Dr. Williams reasoned that the toxicosis which elevated the blood pressure probably also aggravated the old lesions of the posterior spinal roots and helped to produce the lightning pains. He did not believe that an active luetic radiculitis could be present without a lymphocytosis greater than the 3½ per centimeter which was all that was found. Besides, the clinical sign of delayed and aggravated sensibility to deep pain is one characteristic of an inflammation of nerve of toxic etiology, although it is unusual at least to find a delay so long as three seconds. In this case the length of the delay might be attributed to the remains of the chronic radiculitis specific in type.

Another interpretation is possible, viz., that the hypertension and the causes which led to it interfered with the vascularity of the posterior roots so as to permit of their attack by the tabetogen through interference with this man's strong natural immunity. Whatever the explanation, the treatment which ignored the syphilis and was aimed at the toxicosis succeeded perfectly, so that the patient obtained a relief which has lasted now over five months.

The treatment employed was diminution of the proteins to the Chittenden standard, 50 grains per day, and an abundance of saline and carbohydrates in the diet; the cessation of tobacco, alcohol and coffee; a daily sweat bath followed by douches and massage; 80 grs. of aspirin three times a day for three weeks. The pains began to diminish. On May 20 the blood pressure was S. 170, D. 120, a temporary rise not accounted for. June S. 154, D. 95. Only one day of pain necessitating codeine had occurred up to this. June 8, blood pressure S. 150, D. 100.

He weighs 206 pounds, that is a loss of 11 pounds, and feels perfectly well.

An excess of lymphocytes in the cerebro-spinal fluid is almost characteristic of meningeal syphilis, without a chronic form of which tabes dorsalis cannot occur, in the view of many authorities. Tabes dorsalis being merely a result of chronic radiculitis, one would expect lymphocytosis to be a *sine qua non.* The fact that it is so is not altered by the failure of a single examination to reveal a lymphocytosis. To the rare reports of a normal condition of cerebro-spinal fluid in tabes Dr. Williams now adds another; provided that the number of 3.5 lymphocytes per centimeter is not regarded as excessive; for while 3 cells per centimeter is regarded by most cytologists as within normal limits, Sicard protests against not regarding it as pathological. He furthermore believes that lymphocytosis is never absent except perhaps in cases of very long standing indeed, in which the evolution is arrested. Of such a type was the case Souques reported in a woman of 63 who at 48 had diplopia followed by amaurosis, and when examined at 63 showed double optic atrophy, pupil rigidity and loss of one knee and both Achilles reflexes. In a recent symposium at the Paris Neurological Society, this was the general view, but Laignel-Lavestine, using his own method of enumeration, had found in 1901 a case with only one lymphocyte. He also had reported 5 paretics with still less. The improvements in technique since then, however, render his observations doubtful. That lymphocytosis indicates active lesions is believed by many pathologists, with the corollary that its absence denotes an arrest of the morbid process in the meninges. It is believed too that one portion of the rachidian sac may contain at the same time many more lymphocytes than at another.

In line with these observations is the case of progressive ascending amyotrophy reported by Leri, in which, while the cervical meninges were loaded with lymphocytes, in the dorsal region the thickened meninges contained none. This explanation can hardly apply to the case now reported; for the few active symptoms were referable to that very region, the lumbar, in which the puncture was made; and the enumeration was not made by the old method of Ravaut but by the extremely accurate method practiced by Alzheimer and Nageotte.

DIFFUSE SPINAL SCLEROSIS AND MULTIPLE NEURITIS WITH GLOSSITIS FROM PELLAGRA

By Tom A. Williams, M.D.

A woman about 48 gave a history of long standing nervous dyspepsia and anemia. Recently she had become progressively weaker until locomotion was impossible without assistance. Glossitis varying in severity was said to have lasted four years. Pernicious anemia had been suspected; but the blood picture was stated not to have been present. Syphilis was thought of and a mercurial course given without benefit.

Examination.—The characteristic angry red tongue of pellagra was conspicuous. Reflexes of the tendons and periostia all absent except those of the right arm and the left radius, which were very feeble. Plantar reflexes were feeble also, and the pupil reflexes though brisk were not maintained. Tingling and numbness in hands and feet annoyed her. Sensibility to pinprick was lost below the knee except on the tibular border of the feet, where it was feeble, as it was also in the thighs. Touch and vibration were lost and impaired in the same regions respectively. Attitude sense was lost only in the ankles. Pressure pain was everywhere exaggerated. The temperature sense was not tested. Motility was much weakened in the whole of the lower limb, especially so in dorsiflexing the feet. The left triceps was weaker than the right, but the patient was feeble in general. The gait was shuffling and unsteady and she fell readily when unsupported. No tonus could be felt in the muscles which were much wasted. Ataxia was absent.

The interest of the case lies in the absence of pellagra and mental symptoms and the tardy diagnosis, as it is the first case in that district.

TREMOR CHARACTERISTIC OF INSULAR SCLEROSIS AS THE ONLY SYMPTOM

By Alfred Gordon, M.D.

Man of 25 about a year ago on a hot day was overcome by heat. Someone poured large quantities of very cold water over his neck. Rapidly he developed an oscillatory tremor of the head which persists until now. Soon ataxic movements appeared in his hands. At present the intention tremor characteristic of insular sclerosis exists in both hands but is much more marked in the left than in the right. There is no nystagmus, no disturbance of speech. The knee-jerks are somewhat diminished. The condition has not changed since the onset of the trouble.

FACIAL PALSY OF THE UPPER BRANCH OF THE SEVENTH NERVE

By Alfred Gordon, M.D.

Three or four weeks ago the patient noticed that her right eye began to be covered with tears and she could not wrinkle her forehead. At present she shows a distinct facial paralysis of the upper branch of the seventh nerve. The lower branch was slightly affected and the weakness now has almost entirely disappeared. In addition to this a hemispasm of the same side of the face is seen, more marked in the upper part of the face than in the lower. It may be of some significance to note that the right pupil is larger than the left and does not react to light as well as the left. The latter fact may have some bearing on the pathogenesis of the origin of the upper facial branch of the seventh nerve. Mendel cut the upper branch of the seventh nerve in a dog and found changes in the nucleus of the third nerve. The lesion in this case is probably of an irritating and not of a destructive nature in view of the persistence of the hemispasm and of the progressive improvement of the palsy. The electrical stimulation shows only diminution of response but no reaction of degeneration.

Dr. Williams said in regard to the first case, he noticed while the patient was sitting there was an oscillatory tremor of four fingers on the right hand that ceased after the tremor of the left hand began. The very active violent agitation of the hand and arm when the patient endeavored to put his hand to the face when asked to do so contrasted forcibly with the manner in which he raised his hand when he wished to shield his mouth when he coughed: He brought it up in the natural fashion. Dr. Williams also noticed when the patient sat down that the tremor of the head ceased. When he was looked at the tremor always began. In view of these facts, Dr. Williams was inclined to say that this was one of those cases of mythomania (intent to deceive) which Dr. Gordon had so often presented before the Society. He did not think that the shock of heat was the cause of the condition but it may have been the initial circumstance which led to his simulated syndrome, which some might call hysteria, which it might be if acquired from imitation, concerning the opportunities for which evidence is lacking. Great scepticism is essential in the observation of cases of this kind.

Dr. Williams said he had noticed in the second patient that there was spasm of the orbicularis oris, *i. e.,* irritation of the reflex arc of the lower facial. He agreed with Dr. Gordon as to the diagnosis and inquired whether the reflexes in the limbs were equal on the two sides.

Dr. Alfred Gordon said that he was inclined to believe that there was no organic disease in the first case. He knew Dr. Williams had reference to a hysterical condition. There was no sign of hysteria. In regard to the subsidence of the tremor which Dr. Williams observed, at times it becomes less marked. The boy was brought to Dr. Gordon first by his sister and he was six weeks under observation. The mother told Dr. Gordon that for about a year he had to be fed, and he is still being fed. He was unable to find his mouth with his hand. There was no question of simulation. The patient is very poor and anxious to get well. In regard to the oscillatory tremor of the head, it was true at times it becomes less pronounced. Under large doses of bromides and rest in bed it decreased somewhat. Dr. Gordon believed it to be a functional condition. In regard to the second case, the woman, he believed this was an unusual case in view of the limitation of the palsy to the upper branch of the facial nerve.

BABINSKI REFLEX OF EXTERNAL HALF OF FOOT WITH NORMAL PLANTAR REFLEX OF INTERNAL HALF

By E. B. Krumbhaar, M.D.

This example of an unusual Babinski reflex is of interest not only for its own sake but to show how errors of observation can easily be made in using that important diagnostic sign.

The patient, a laborer of 38, had an attack of right-sided hemiplegia 18 months ago. While working on the street he was forced to sit down on account of dizziness. One hour later, after reaching home, he was unable to get up from his chair on account of loss of power in his right arm and leg. After five days in bed he was able to be about again, but the signs of hemiplegia still persist: weakness, limitation of movement, increased reflexes, and so forth.

A true Babinski reflex is present, with slow extension or dorsal flexion of the great toe and fanning of the smaller toes, when the greater part of the sole and the plantar surfaces of the toes are stroked. In a small area, however, corresponding roughly to the ball of the great toe and four to six centimeters posterior and mesial to this part, stroking gives an equally marked plantar flexion of all the toes and especially of the great toe. On the heel and most of the dorsal surface of the foot, a few weeks ago no response whatever was obtained. Now stroking the heel causes extension of the great toe. On a small surface, about the base of the great toe, stroking causes extension. Oppenheim's reflex, pressure along the inner surface of the tibia, causes at times slight extension of the toe, while squeezing the calf muscles, and irritation of any other sensory nerves produce no response. The test on the left foot is accompanied by such a marked withdrawal reaction that the movements are masked. What independent movements of the toes there are correspond to the reactions in the right foot, only are quicker and less ample. A slight crossed reflex of the right toe is also present.

Thus it can easily be seen how an improper observation might be made. By stroking the internal surface of the foot only a normal plantar reflex is elicited; or a stroke reaching both inner and outer surfaces gives a confused double reaction, not a true Babinski. In other words both the internal and external surfaces should be tested separately.

An explanation of the conflicting results in this patient's reflexes cannot be given. It was noted, however, that on consulting the charts of cutaneous nerve distribution, all areas supplied by nerves containing filaments from the sacral cord produced extension, even to the small surface at the base of the great toe dorsally; whereas the first branch of the internal plantar (the only one containing only lumbar filaments) was the only one to cause plantar flexion.

In Babinski's earliest complete description of his "Phenomenon d'éventail" (*Sem. Méd.* 1906, p. 321) he calls attention to certain "formes frustes" among which the present example falls. For instance, he says that plantar excitation may give extension of the big and second toe only, with flexion of the other toes (very commonly seen), or plantar excitation of external side may give extension, and of internal side flexion (like the present case), or excitation in any part whatever may give either flexion or extension. In this same lecture, he points out that the reflex is not found in neuritis, hysteria, pure tabes or the myopathies; whereas Marinesco has shown that in cases without pyramidal lesions it may be present in sleep, narcosis, hyoscine medication or after an epileptic attack. In babies it is normally present in 92 per cent. till the eighth week, 77 per cent. till the twelfth month and 5 per cent. at the third year.

Dr. F. X. Dercum said he thought all were familiar with the fact that we frequently get no reaction from the toe by irritation of the general plantar surface but very frequently get prompt reaction by stroking the external border of the foot, the outer portion of it.

Dr. E. B. Krumbhaar said that, as stated above, atypical reflexes such as the present had been included by Babinski in his "formes frustes." He wanted to show it more particularly as a striking example of how easily one could fall into an error of observation.

PROFOUND SOMNOLENCE OR NARCOLEPSY

By F. X. Dercum, M.D.

The patient, N. M. S., male, age 32, American by birth; color, white, and by occupation a clerk.

The family history is somewhat obscure. The father is said to have died of nervous exhaustion, while the mother died of some cause unknown. There are two brothers and two sisters who are living and well. A paternal uncle was insane at thirty-five.

The personal history is briefly as follows. He states that he has had the usual diseases of childhood. Had malaria at fifteen years of age and later suffered from rheumatism. Says that as a boy he did not associate with other boys but liked to be in the company of girls. Both boys and girls would make sport of him on this account. He was of average size until he was about sixteen years of age when he suddenly grew very rapidly. At nineteen he had attained his present stature, five feet, ten inches. At eighteen he entered a military school, but was obliged to return home within two months, because he became afraid and very nervous. At this time also he began to suffer greatly from nightmares and would have visions of bloody and terrible tragedies. He used alcohol very moderately.

Claims that his present trouble began at fifteen years of age. He then had an attack of influenza, during the convalescence of which he began to get sleepy. He states that upon one occasion he slept for five days continuously. Once while asleep he fell down an elevator shaft and would fall asleep repeatedly in the daytime while at work, and sometimes he injured himself. Says that at first he was worse than he is at present. At present he often falls asleep while eating his meals or talking to friends. Has suffered from headache during the past two months, which he refers to the brow and to the temples.

The neurological examination of the patient is negative. His station, gait and reflexes are normal. The eyegrounds are normal. An examination of the blood reveals a negative Wassermann. An histological examination of the blood and an examination of the urine were negative likewise. There are none of the stigmata of hysteria. There is no history of epilepsy.

Evidently the affection from which the man suffers is neither due to hysteria, epilepsy nor to syphilis. It is very probable that the somnolence is due to a disease of the internal secretions. His features, face, head, hands and feet suggest acromegaly. The enlargements are not typical, however, but they are at least suggestive. A question as to his sexual capacity reveals the fact that he is incompetent and an examination of his testicles reveals them to be exceedingly small; indeed they are hardly the size of beans. The penis appears to be of average size and there is hair upon the pubis and in the axillæ. The patient states that formerly his testicles were quite large. He believes them to have been of normal size and he claims to have had, years ago, Neisserian infection, but he has not had any sexual intercourse for many years.

While under observation in the ward, it was noted that the patient slept not only during the night but slept at irregular intervals sometimes for hours at a time during the day. When awake he responded properly to questions and conducted himself normally, save that he was somewhat silly. He would laugh unduly and did not seem to realize the rather serious nature of his trouble. His sleep during the night was frequently interrupted by unpleasant dreams.

A skiagraph fails to reveal an enlarged pituitary fossa nor do the plates show any indications of calcification of the pineal gland. An examination of the thyroid shows it to be somewhat full, though one could hardly describe it as pathological.

Notwithstanding the negative findings, the clinical picture suggests, as just stated, a disease of the internal secretions. It is not improbable that the influenza, from which he suffered and which appears to have occurred just preceding the first attack of his somnolence, may have in some way damaged the glands of internal secretion and perhaps the pituitary. It is not impossible that the sudden increase in his stature which came on also subsequently to the attack of influenza was due to the stimulation of the pituitary gland. The subsequent course of the case, especially the atrophy of the testicles, may have followed atrophic or degenerative changes in the pituitary; at least such a supposition is in keeping with our increasing knowledge of the functions of this structure. The atrophy of the testicles is in keeping with the atrophy which follows extirpation of the pituitary in dogs.

The man was placed upon five grains of thyroid extract three times daily.

The somnolence diminished markedly under the use of the thyroid and the patient is still under observation.

Dr. F. X. Dercum said there were no distinct signs about the man that would attract attention. He has not the marked features of acromegaly, but he has a suggestive history of having grown very rapidly when these attacks first came on. We may have cases of incomplete acromegaly without marked distortion of the features in which we have no doubt disturbance of internal secretion. Sexually the case is very interesting because of the marked atrophy of the testicles.

Dr. Charles K. Mills said that in connection with Dr. Dercum's presentation he might refer again to one of the cases shown at the last meeting—the tall, stout young man with large hands, diminished sexual power, temporal hemianopsia with optic atrophy and other symptoms of hypophyseal lesion. Dr. Mills said that since the last meeting Dr. Frazier had performed his fronto-orbital operation for exposing the hypophysis, and had found a pituitary growth, which he had in part removed. The correctness of the diagnosis of pituitary lesion was therefore shown by operation; and Dr. Mills had also learned that microscopical investigation, which was still being conducted, showed the correctness of the idea that the anterior lobe of the pituitary was especially the seat of pronounced disease.

SPINAL GLIOSIS OCCURRING IN THREE MEMBERS OF THE SAME FAMILY, SUGGESTING A FAMILIAL TYPE

By George E. Price, M.D.

Exhibition of two brothers and a sister, aged 13, 22, and 24 years respectively, having in common a history of painless sores and burns upon fingers and toes appearing first at the age of 8 or 10 years. All three cases presented marked trophic changes of hands and feet. Fingers and toes were clubbed and in some instances there was loss of part or all of the distal phalanx. The skin over the affected areas was thickened and the nails (where preserved) were thickened and presented marked transverse ridges. Many of the small joints of the fingers and toes were enlarged and stiffened but painless. All forms of sensation were completely lost over the hands and feet, also over forearms and legs to a variable extent in the different cases. Above the area of complete anesthesia sensation was diminished but improved gradually as the shoulders and hips were approached, becoming normal at the trunk. At no point was there any dissociation of sensation. All reflexes of the extremities were lost. There was no muscular wasting, rigidity nor paralysis. Babinski's sign and ankle clonus were absent. The mentality of each patient was normal.

Ophthalmologic findings were unimportant. Urinalyses and blood examinations were negative as was also a Wassermann test in the case of each patient.

An X-ray examination of the hand of one of the patients and the foot of another showed a trophic loss of bone substance in some of the terminal phalanges.

The family history was negative as to nervous or mental disease, tuberculosis or alcoholism. The father and mother are living and well and have two other children aged 5 and 6 years respectively, who show no evidence of a condition similar to that presented by their brothers and sister.

Reference was made to the resemblance of the symptom complex to that described by Morvan in 1883 and of the changes found in the spinal cord (gliosis) and peripheral nerves in Morvan's disease by Joffroy and Achard, Thomas, Gombault and others. Dr. Price said that he had been unable to find any instance of the syndrome occurring in two or more members of one family and suggested the possibility of a new familial type.

Dr. Charles K. Mills said that this series of cases was one of the rarest and most interesting that had been presented to the Philadelphia Neurological Society in a long time. The cases were particularly interesting because of the occurrence of several instances in the same family. The chances were, he thought, as he believed Dr. Price had suggested, that they were somewhat of the nature of Morvan's disease, which is now considered by most authorities as due to gliosis of the cord. The data regarding the blood vessels required special attention in connection with the discussion of pathogenesis.

Dr. J. Hendrie Lloyd said these were very interesting cases. He inquired whether there had been pain.

Dr. Price replied that there had been no pain.

Dr. Lloyd said that the absence of pain and the destruction of the distal phalanges made the affection look very much like Morvan's disease. In that disease, he understood, there was analgesia without muscular atrophy as a rule. We have had recently in this country, especially amongst Jewish emigrants, an endarteritis obliterans, causing destruction of large parts of limbs, hands, and feet, but Dr. Lloyd did not remember having seen such a group in American-born citizens. There was one other thing to be taken into account, and that was the possibility of anesthetic leprosy. Dr. Lloyd said he did not profess to know very much about anesthetic leprosy. The first case he ever saw in his life was seen this past summer; the man came from the Hawaiian Islands and had marked anesthesia, and thickening of nerve trunks, but no gangrene. Clinically the present cases looked more like Morvan's disease than anything else. As he understood, there was not the periodical occurrence of local syncope, local asphyxia, and gangrene, such as is seen in Raynaud's disease.

Dr. Dercum said that he thought that the occurrence of the three cases in one family was very remarkable and should be especially accentuated. That they were not leprosy it seemed to him quite clear. Besides they were examined by Dr. Stelwagon and Dr. Gaskell, who pronounced them not leprosy.

Dr. Tom A. Williams said he thought like the other speakers that the cases were of intense interest in view of the possible heredity. In the first place, most of the French authorities who have studied Morvan's disease believe it a variant of spinal gliosis. If this is confined to the postero-lateral region, that is to say the root zone in the posterior horn, the symptoms would resemble those of the patients shown in some respect. In one case (Thomas) in which only one posterior horn was affected the patient died before there was any syringomyelia. If we regard these cases as being merely spinal gliosis we must look upon them from the aspect of the development of rests, the Cohnheim notion. Strong evidence in favor of that view of syringomyelia is afforded by the

French obstetrician who reported (Neur. Soc. de Paris, 1909) two cases of spinal gliosis in both. That would lead us to think that spinal gliosis is really a congenital affection. If these premises can be accepted, then we have to look very carefully into the family tree, and that has not been done adequately in cases of Morvan's disease in France. The question is whether it is possible to ascertain it in view of the manifestations skipping a generation (heterozygotism). It does not follow that the other two children will have the affection at all. Normal development in them may be a dominant; or it may be in these cases not the dominant, or it may be that they are heterozygotes and have the potentiality which will transmit gliosis to their descendants.

Dr. Theodore H. Weisenburg said that a residence of several years in the Philippine Islands had given him an opportunity to see many hundreds of cases of leprosy and he believed the cases presented by Dr. Price were not leprosy. He said he made these remarks because of Dr. Lloyd's suggesting that they might be.

LESION IN THE RIGHT SUPERIOR CEREBRAL PEDUNCLE

By T. H. Weisenburg, M.D.

Man of 70 who had been acting as an orderly in the Philadelphia Hospital. On the morning of August 16, while walking across the room, became dizzy and had a sensation as though his left side was going to sleep and then fell to the floor. He was transferred to the nervous wards, service of Dr. Weisenburg, complaining of a numb, dead-like feeling on the whole left side of the body, of seeing double, one object above the other, and weakness upon the left side. Examination, after his admission to the nervous wards showed a distinct but slight left hemiplegia, which was manifested by a drooping of the left side of the face, inability to show his teeth as well upon that side as the right, weakness in the left arm and leg as compared with the right and increase of reflexes, but no distinct Babinski. At the same time he had a loss of sensation for pain and temperature on the left side and not for touch. This was complete and limited to the median line. At this time there was very little, if any, difficulty in talking and eating.

Subsequently power began to return in the left side of the body and at the present time he can use his limbs on the left side as well as those on the right. Loss of sensation for pain and temperature which at one time was absolute is now not as marked as it has been, it returning in the distal portion of the left leg first and then in the left hand. At the present time sensation for pain and heat and cold is only slightly impaired. Touch is normal and always has been. Sense of localization has been preserved. There is not and never has been disturbance of the sense of position, motion and localization, but pressure sense has been impaired as compared with the limbs on the right side.

A first he had weakness of the right external rectus and right inferior oblique. At present he still has some weakness of the right external rectus but this is not so marked. His pupils do not react as quickly to light as they should. Examination by Dr. Roberts shows that there is no paralysis whatsoever of the palate, pharyngeal muscles or vocal cords and there is no disturbance of sensation.

Within a few days of the onset of the weakness on the left side the patient began to have difficulty in talking, his speech being thick and indistinct. This has persisted. Besides he has some difficulty in swallowing solid food. Liquids he swallows well. This he still has to some extent; but more marked than this has been the gradual ataxia which has developed in both arms and legs, but particularly the right. For about seven weeks after the onset he was in bed and the ataxia increased and was of a peculiar intention type, particularly so in the right arm and leg. When he became strong enough this ataxia was manifested in his station and gait which was distinctly ataxic, the patient having a tendency to stagger to the right and to a less extent to the left. This he still has but the intention type of ataxia is not so marked.

He has also complained of some diminution in hearing. Ear examination demonstrates that low notes are well heard. Air conduction is better than bone conduction but there is great impairment of the upper notes with considerable nerve deafness. Patient also has some nystagmus on excursion to both sides, but more marked to the right. Repeated Wassermann examinations of the blood and spinal fluid have been negative.

Summary.—A man of 70, negative specific history, suddenly develops weakness on the left side manifested by numbness and pain. Examination shows a slight left hemiplegia with complete absence of pain and temperature sensation and preservation of touch. Also weakness of the right external rectus and inferior oblique. The left sided weakness has disappeared and sensation for pain and temperature has returned and now it is only slightly impaired. A few days after the onset a gradual development of ataxia in all the limbs, particularly the right, of the intention type. Disturbance of speech and of swallowing, particularly solid foods. The ataxia still remains as well as the disturbance in talking and to a less extent in eating. There has never been palsy in the palate, pharynx, larynx and vocal cords.

Diagnosis.—The symptoms are indicative of a lesion which is either hemorrhagic or thrombotic in the right cerebral peduncle, it involving the fibers of pain and temperature sensation and the nucleus ruber. The temporary hemiplegia can be readily explained on the theory that the motor bundles were only partially involved. There is only one point against this diagnosis and this is the palsy of the right external rectus.

Such a lesion as this is very rare. The symptom-complex is somewhat similar to a case reported by Dr. C. K. Mills of thrombosis of the superior cerebellar artery.

A CASE OF OCCLUSION OF THE POSTERIOR INFERIOR CEREBELLAR ARTERY.

By Charles K. Mills, M.D.

The patient was a man 38 years old, who was admitted to the hospital of the University of Pennsylvania early in July with the statement that he had been overcome with the heat. Just before admission he had had on the street recurrent attacks of vertigo which caused him to stagger. In the second attack of vertigo which occurred about one hour after the first he vomited and had severe headache, especially on the left side above the eye. He had a history of Neisserian infection, but denied syphilis.

Examination at the time of admission showed that the pupils were unequal, the right being larger than the left, although both were small.

They responded both to accommodation and convergence. The left pupil did not respond to light and the right only slightly. The ophthalmoscopic examination showed no fundus changes. The left eye had the appearance of a slight enophthalmus, being somewhat sunken looking as compared with the right. Nystagmus was brought out on lateral excursion. The patient was deaf on the right side. His tongue was tremulous. Babinski response was present on both sides. Patient complained of double vision. The Wassermann test was found to be medium positive.

Several later examinations showed the following symptoms which remain at the time of presentation, although modified somewhat in their intensity. He had instability on testing his station with eyes open or shut, the tendency being to fall or trend towards the left. He showed this same tendency to go to the left in walking. His head also inclined somewhat to the left. He had no ataxia on finger to nose test or heel to knee test. His ataxia of station was not increased by shutting his eyes. The Babinski response continued present on both sides. Both knee jerks were marked, the right being decidedly hypertonic. He had loss of the sense of pain and extreme heat and cold in the limbs and trunk of the right side but not in the face, at least only to a slight degree. Testing on the face he could distinguish between a finger and the pin point, but said that the latter felt like a finger nail. The conjunctival reflex was impaired on the right. Irritating the nasal mucous membrane did not cause a flow of tears. Sensation was impaired on the left side of the face but not in the limbs of this side. The right side of the face showed a relaxation amounting almost to a paresis, but this appeared to be overcome when the patient was actively interested. The deafness on the right side was of nerve origin, although he had some impairment of hearing on both sides due to middle ear involvement. Some of the examinations seemed to show slight impairment in upward rotation of the left eye, apparently due to paresis of the inferior oblique muscle.

This case was distinctly different from that of lesion of the superior cerebellar artery previously reported to the Society by Dr. Mills, and also from that presented at the present meeting by Dr. Weisenburg. Dr. Mills believed that the case probably showed in a nearly pure form the symptoms of occlusion of the posterior inferior cerebellar artery. What was very noticeable was the presence of the ataxia of station and gait with the absence or scarcely perceptible presence of incoördination in the upper extremity. It was also noticeable that the sensory impairment was somewhat of the alternating type, this being in the face on the left and on the right in the arm and leg, alhough there was some incomplete and restricted sensory loss in the right side of the face. The enophthalmus and pupillary phenomena pointed to a sympathetic origin.

Dr. Spiller said that for several years he had been much interested in the syndromes produced by occlusion of separate vessels of the central nervous system. He had written on occlusion of the posterior inferior cerebellar artery, and was the first to describe the symptom-complex of occlusion of the upper part of the anterior spinal and vertebral arteries, and also the complex of occlusion of the median spinal artery in the cervical enlargement. With Dr. McConnell, he had described occlusion from carbon monoxide poisoning of the vessels supplying the inner segment of the lenticular nucleus. Dr. Mills had reported a case of occlusion of the superior cerebellar artery.

The case of occlusion of the posterior inferior cerebellar artery presented by Dr. Mills interested him because it illustrated what he (Dr. Spiller) had first observed and reported, viz., that the conjunctival and corneal reflexes depend on the preservation of the fibers of pain. The man had preservation of tactile sensation in the face but pain and temperature sensations in the face were lost and the reflexes referred to were abolished.

The most difficult feature to explain in the case presented by Dr. Weisenburg was the paralysis of the abducens nerve, if the lesion were where Dr. Weisenburg located it.

Dr. Weisenburg said the sixth nerve palsy had puzzled him and he was unable to account for it.

Dr. Charles K. Mills said he thought the cases were both pretty well made out as regards one being a lesion of the superior and the other of the posterior inferior cerebellar artery. He also said that Dr. Ludlum and Dr. Williams have been injecting the cerebellar arteries for him in order to determine certain points in connection with these cases. One interesting point regarding the superior cerebellar artery is that these injections show definiteness of distribution not only in the cerebellum and superior cerebellar peduncle, but to certain parts of the lateral tegmental region. The real symptom-complex of a cerebellar, as of other arteries, can be made out on the basis of the function-complex resulting on biological and physiological principles from exact consideration of the tracts and cellular masses supplied by certain arteries. Dr. Mills reiterated what he had said in presenting the case, that many, and he thought most of the cases recorded as instances of occlusion of the posterior cerebellar artery were not strictly of this character. In many of the cases with necropsies the records show that the vertebral or basilar, or both of these, were more or less occluded. The posterior inferior cerebellar being sometimes also partially blocked. Such lesions would give rise to a complex symptomatology in which the syndrome of the posterior inferior cerebellar artery might be more or less included, but they would not give the true diagnostic symptomatology of this artery. The case shown by him seemed to be one in which the occlusion was confined or very largely limited to the posterior inferior cerebellar.

Dr. Alfred Reginald Allen and Dr. J. Edwin Sweet read a paper on The Effect of Removal of the Hypophysis Cerebri in the Dog.

Dr. F. X. Dercum said that of course the statements presented were in keeping with our clinical investigations of hypo-pituitarism as far as the depression of sexual function and heaping up of fatty tissue are concerned. It seems rather strange that the men who are experimenting on the pituitary body take no note of the so-called extra-cranial portion of the gland. Is it that the anatomists are correct in considering this glandular structure as a part of the pituitary or is it something else?

Dr. Alfred Reginald Allen said that in so far as the extra-cranial part of the hypophysis is concerned he presumed that Dr. Dercum referred to the possible rest of cells left between the pharynx and the base of the sella turcica. Dr. Allen said he did not think Dr. Dercum remembered that Dr. Cushing had taken good note of that in the book he has recently published, and also Dr. Cushing speaks of a parahypophysis which lies below the hypophysis in a small pocket of the dura mater, impossible to get at in life and pretty hard to get at in necropsy. Of course whether these are complicating questions or not remains to be determined.

Translations

MYTH OF THE BIRTH OF THE HERO

[A PSYCHOLOGICAL INTERPRETATION OF MYTHOLOGY]

BY OTTO RANK

OF VIENNA

TRANSLATED BY DRS. F. ROBBINS AND SMITH ELY JELLIFFE

(*Continued from page 133*)

PARIS

Apollodorus relates of the birth of Paris: King Priamos had with his wife Hekabe a son, named Hektor. When Hekabe was about to bear another child, *she dreamed* that she brought forth a burning log of wood, which set fire to the entire city. Priamos asked the advice of Aisakos, who was his son with his first wife Arisbe, and an expert in the interpretation of dreams. Aisakos declared that the child would bring trouble upon the city, and advised that it be exposed. Priamos gave the little boy to a slave, who carried him to the top of Mount Ida; this man's name was Agebos. *The child was nursed during five days by a she-bear.* When Agebos found that he was still alive, he picked him up, and carried him home to raise him. He named the boy Paris; but after the child had grown into a strong and handsome youth, he was called Alexandros, because he fought the robbers and protected the flocks. Before long he discovered his parents. How this came about is told by Hyginus, according to whose report the infant is *found by shepherds.* One day messengers, sent by Priamos, come to these herders to fetch a bull which is to serve as the prize for the victor in the combats arranged in commemoration of Paris. They selected a bull which Paris valued so highly that he followed the men who led the beast away, assisted in the combats, and won the prize. This aroused the anger of his brother Deiphobos, who threatened him with his sword, but his sister Kassandra recognized him as her brother, and Priamos joyfully received him as his son. The misfortune which Paris later on brought to his family and his native city, through the abduction of Helena, is well known from Homer's poems, and their prologue and epilogue.

A certain resemblance with the story of the birth of Paris is presented by the poem of Zal, in Firdusi's Persian hero-myths (translated by Schack). The first son is born to Sam, king of Sistan, by one of his consorts. Because he had white hair, *his mother concealed the birth.* But the nurse reveals the birth of his son to the king. Sam is disappointed, and commands that the child be exposed. The servants carry it on the top of Mount Alburs, where it is raised by the Somurgh, a powerful bird. The full grown youth is seen by a travelling caravan, whose members speak of him "as whose nurse a bird is sufficient." King Sam once *sees his son in a dream,* and sallies forth to seek the exposed child. He is unable to reach the summit of the elevated rock where he finally espies the youth. But the Somurgh bears his son down to him, he receives him joyfully and nominates him as his successor.

TELEPHOS

Aleos, King of Tegea, was informed by the *oracle* that his sons would perish through a descendant of his daughter. He therefore made his daughter Auge a priestess of the goddess Athene, and threatened her with death should she mate with a man. But when Herakles dwelt as a guest in the sanctuary of Athene, on his expedition against Augias, he saw the maiden, and when intoxicated he raped her. When Aleos became aware of her pregnancy, he delivered her to Nauplios, a rough sailor, with the command to throw her into the sea. But on the way she gave birth to Telephos, on Mount Parthenios, and Nauplios, unmindful of the orders he had received, carried both her and the child to Mysia, where he delivered them to King Teuthras.

According to another version, Auge secretly brought forth as a priestess, but kept the child hidden in the temple. When Aleos discovered the sacrilege, he caused the child to be exposed in the Parthenian mountains. Nauplios was instructed to sell the mother in foreign lands, or to kill her. She was delivered by him into the hands of Teuthras.

1. In the version of Euripides, whose tragedies "Auge" and "Telephos" are extant, *Aleos caused the mother and the child to be thrown into the sea in a box,* but through the protection of Athene this box was carried to the end of the Mysian River,

Kaikos. There it was found by Teuthras, who made Auge his wife and took her child into his house as his foster son.

According to the current tradition, *Auge exposes the newborn child* and escapes to Mysia, where the childless King Teuthras adopts her as his daughter. The boy, however, is nursed by a doe, and is found by shepherds who take him to King Korythos. The king brings him up as his son. When Telephos has grown into a youth he betakes himself to Mysia, on the advice of the oracle to seek his mother. He frees Teuthras, who is in danger from his enemies, and in reward receives the hand of the supposed daughter of the king, namely his own mother Auge. But she refuses to submit to Telephos, and when he in his ire is about to pierce the disobedient one with his sword, she calls on her lover Herakles in her distress, and Telephos thus recognizes his mother. After the death of Teuthras he becomes king of Mysia.

PERSEUS

Akrisios, the king of Argos, had already reached an advanced age without having male progeny. As he desired a son, he consulted the Delphian oracle, but this warned him against male descendants, and informed him that his daughter Danae would bear a son through whose hand he would perish. In order to prevent this, his daughter was locked up by him in an iron chamber, which he caused to be carefully guarded. But Zeus penetrated through the roof, in the guise of a golden rain, and Danae became the mother of a boy.[1] One day Akrisios heard the voice of young Perseus in his daughter's room, and in this way learned that she had given birth to a child. *He killed the nurse,* but carried his daughter with her son to the domestic altar of Zeus, to have an oath taken on the true father's name. But he refuses to believe his daughter's statement that Zeus is the father, and *he encloses her with the child in a box,*[2] *which is cast into the sea.* The box is carried by the waves to the coast of Seriphos, where *Diktys, a fisherman,* usually called a brother of King Polydektes, *saves mother and child by drawing them out of the sea with his nets.* Diktys leads the two into his house and keeps them as his relations. Polydektes, however, becomes enamoured of the beautiful mother, and *as Perseus was in his way, he tried to remove him* by sending him forth to fetch the head of the Gorgon Medusa. But against the king's anticipations Perseus accomplishes this difficult task, and a number of heroic deeds besides. In throwing the discos, at play, he accidentally kills his grandfather, as foretold by the oracle. He becomes the king of Argos, then of Piryuth, and the builder of Mykene.[3]

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[1] Later authors, including Pindar, state that Danae was impregnated, not by Zeus, but by the brother of her father.

[2] Simonides of Keos (fr. 37, ed. Bergk), speaks of a casement strong as ore, in which Danae is said to have been exposed. (Geibel's: Klassisches Liederbuch, page 52.)

GILGAMOS

Aelian, who lived about 200 A. D., relates in his "Animal Stories" the history of *a boy who was saved by an eagle.*[4]

"Animals have a characteristic fondness for man. An eagle is known to have nourished a child. I shall tell the entire story, in proof of my assertion. When Senechoros reigned over the Babylonians, the Chaldean fortune-tellers foretold that the son of the king's daughter would take the kingdom from his grandfather; this verdict was a prophecy of the Chaldeans. The king was afraid of this prophecy, and humorously speaking, he became a second Akrisius for his daughter, over whom he watched with the greatest severity. But his daughter, fate being wiser than the Babylonian, conceived secretly from an inconspicuous man. For fear of the king, the guardians threw the child down from the Akropolis, where the royal daughter was imprisoned. The eagle, with his keen eyes, saw the boy's fall, and before the child struck the earth, he caught it on his back, bore it into a garden, and set it down with great care. When the overseer of the place saw the beautiful boy he was pleased with him and raised him. The boy received the name Gilgamos, and became the king of Babylonia. If anyone regards this as a fable, I have nothing to say, although I have investigated the matter to the best of my ability. Also from Achaemenes, the Persian, from whom the nobility of the Persians is derived, I learn that he was the pupil of an eagle."[5]

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[3] According to Hüsing, the Perseus myth in several versions is also demonstrable in Japan. Compare also, Sydney Hartland, Legend of Perseus, 1894.

[4] Claudius Aelianus, "Historia animalium," XII, 21, translation by Fr. Jacobs (Stuttgart, 1841).

[5] It was also told of Ptolemaös, the son of Lagos and Arsinoë, that an eagle protected the exposed boy with his wings against the sunshine, the rain and birds of prey (*loc. cit.*).

(*To be continued*)

Periscope

Allgemeine Zeitschrift für Psychiatrie

(Vol. LXVIII, part 6)

1. The Psychology of Observation in Dementia Præcox. VERA EPPELBAUM.
2. Affect Epilepsy in Psychopaths. STALLMAN.
3. Psychical Disturbances after Carbon Monoxide Poisoning. GOTTHARD GIESE.
4. Alcohol and Homosexuality. P. NAECKE.

1. *The Psychology of "Aussage" in Dementia Præcox.*—In order to examine memory, retention, etc., the authoress exposed to her patients two different pictures, the one more complicated than the other and at the end of 48 hours and again after one month requested them to describe just what each picture represented, their statements being taken down exactly. She also examined them in the same way about a little pantomine which had formed part of an outdoor fête which had been given for the patients. A study of the replies shows that memory was surprisingly little affected, though various additions and false interpretations were made, the whole bearing a strong impress of the character of the individual, his emotional condition at the time and of whatever delusional ideas he had, and giving a look into the mental processes in schizophrenia. It is impossible to give the authoress' analysis here. Those specially interested in the psychology of dementia præcox should consult this article in the original.

2. *Affect-Epilepsy in Psychopaths.*—The author gives the histories of six cases, in which, usually as a result of a strong emotion, attacks in appearance in no way different from those of genuine epilepsy occurred. All of these individuals had a strong neurotic heredity, were unstable psychopaths and through their methods of life had come into collision with the law more or less frequently. The attacks were always excited by some emotional stimulus, as trial, imprisonment, rage at the remarks of fellow patients, an unsuccessful attempt at suicide, etc. In the absence of the stimuli there were no attacks, at any rate for very long periods, while with the recurrence of the irritant, the attacks again occurred. The attacks had, so far as could be made out, no permanent influence upon the mentality of the individual, particularly there was no decrease of intellectual capacity. On the contrary, in four cases, the quiet life of the asylum and the absence of irritants were followed by decided improvement, both mental and physical. The attacks differed from those of true epilepsy in their episodic occurrence. All the patients were in the third decennium. The chief difficulty is in distinguishing these cases from hysteria. The diagnosis rests chiefly upon the absence of the mental and physical stigmata of this last disease.

3. *Psychical Disturbances after Carbonic Monoxide Poisoning.*—The author gives a somewhat extended review of the subject and adds the clinical histories of two cases which had come under his personal obser-

vation. Clinical pictures in carbonic monoxide poison vary, from those of severe organic forms with fatal ending, to slight confusional conditions with memory defect and termination in more or less complete recovery. The symptoms appear to be, not so much, those of severe organic change in the nervous system as the functional results of the poison, though the two may be combined. In the main the mental symptoms are those of a toxic delirium. The author's two cases presented the Korsakow symptom-complex with a peculiar disturbance of handwriting and ended in a neurasthenic condition.

4. *Alcohol and Homosexuality.*—The author considers the subject under three heads. (1) Can alcohol produce true homosexuality? (2) Has alcohol an injurious effect upon " Urnings " and to what extent? (3) Do the homosexual specially tend to drink and do they present types of drinkers different from the heterosexual? The first question he answers negatively in case there is no positive predisposition, but given the latter, alcoholic abuse may cause sexual inversion. As to the second question. Alcohol works equally as unfavorably upon the urning as upon the normal individual. It paralyzes judgment and inhibition, increases lust and opens the way for perversity and excesses. To the third question is to be answered, that the urning as a rule drinks little, is seldom a toper, but if he does drink, he differs in no way from the heterosexual drinker. The drinker types among these people differ in no way from those found among the sexually normal.

C. L. Allen (Los Angeles).

Deutsche Zeitschrift für Nervenheilkunde

(Band 44. Heft 1 and 2)

1. Pain on Deep Pressure in Tabes. Goldstein.
2. Hemiatrophy and Hemihypertrophy. Stier.
3. Progressive Hypertrophic Neuritis. Hoffmann.
4. A Case of Multiple Spinal Cord Tumor. Reichmann.
5. Hereditary Tremor. Kreiss.
6. A Case of Symmetrical Combined Disease of the Nerves. Leuaz.
7. Theory of the Mechanism of Associated Movement of the Eyes. Marina.

1. *Pain in Tabes.*—Goldstein investigated the deep pressure sense in many cases of tabes, by means of the algometer of Cattell. His conclusions showed that the curve of the algometer records in persons with tabes varied markedly from that of healthy individuals. A marked reduction of pressure sense was noted in one third of the tabetics. This decrease was frequently associated with ataxia and disturbance of tactile sensation, though it was also noted when only one or the other symptom was present.

2. *Hemiatrophy.*—The writer has reported several clinical cases with a discussion of the various theories as to the causation. These clinical pictures are produced, according to him, by disease of special growth and trophic centers in the cerebral hemisphere.

3. *Neuritis.*—The chief characteristic was a thickening of the nerve trunks. The symptom-complex, according to Hoffmann, was closely related to the Charcot-Marie-Tooth type of progressive muscular atrophy.

4. *Spinal Cord Tumor.*—The patient, æt. 20 years, began with stiffness

in calves. This was followed by stiffness in the thighs and difficulty in urination. Later pain developed in the pelvis. Besides he showed multiple neuro-fibromata throughout the body. Lumbar puncture revealed a marked increase in the percentage of albumin. One year later sensory disturbance was noted in the lower extremities. At operation, several tumors were removed from the thoracic region. The patient recovered.

5. *Hereditary Tremor.*—The tremor was noted in nearly every portion of the body. A mild tremor was present at rest, while on movement it became intensified. An interesting feature was the tendency for the tremor to appear earlier in each succeeding generation. The author found it present in three generations.

6. *Disease of the Nerves.*—The writer reported a case of double symmetrical lesion of the ulnar nerves and one portion of the median, the result of separate traumas occurring eight years apart. From a study of his case he inferred that the middle root of the median nerve was purely sensory and had an irregular distribution over the ring and middle fingers.

7. *Associated Movements of the Eyes.*—The author has experimented on apes in his study of lateral movement of the eyes and convergence. His plan was to transplant the rectus superior in the place of the rectus internus and, after the action of the latter was excluded, to investigate how the voluntary lateral movements, the automatic, the lateral movements by stimulation of the cortical zone would behave in these animals. Three or four days following operation, the voluntary and automatic movements occurred completely; rotatory nystagmus occurred on both sides, also completely. He concluded from his studies, which have extended over some years, that in apes, at least, there was no supranuclear or nuclear center for convergence. From the fact that the lateral associated movement occurred whether with two r. interni or with one r. externus and one superior oblique, etc., he concluded that in apes there was no supranuclear or nuclear center for lateral movements.

It was evident also from his studies that no special association pathways were necessary and that the conduction pathways have no fixed function.

S. Leopold (Philadelphia).

Allgemeine Zeitschrift für Psychiatrie

(Band LXIX, Heft 1. 1912)

1. Psychiatric Examination of Children in Schleswig Institutions. Dr. Hinrichs.
2. Psychiatry in Baden. M. Fischer.
3. Status Epilepticus and Treatment by Atropine. Dorner.
4. Salvarsan in Psychiatry. A. Pfunder.

1. *Psychiatric Examination of Children Segregated in Burschenheim, Frauenheim and Neuendeich.*—The author examined a total of 84 males and 60 females in these institutions, most of them coming from the large cities Kiel and Altona, only 20 from the country. The majority came from the lowest classes of the population and in the family life, conditions of poverty and degradation were general, alcoholism in the parents and the children themselves, immorality and prostitution among the girls being the rule.

The author exposes his findings in 17 tables. Of the 144 patients he classes 62 as normal mentally, though nearly half of these showed psychopathic symptoms, 8 were psychopaths, 48 feeble-minded, 24 imbeciles, 1 epileptic and 1 idiot. One hundred and eight were considered as being capable of improvement; in 36 there was little prospect of accomplishing anything through instruction.

2. *The Newer Aims of Psychiatry in Baden.*—After sketching the development of care for the insane in Baden, which state in 50 years has increased its accommodation from 900 beds to 4,000 and expects by 1917 to add nearly 1,000 more, the author takes up matters other than the building and equipping of asylums, but which are nevertheless part of the organized care for the insane.

He discusses: (1) Family care outside of institutions. (2) District asylums and poor-houses. These he thinks (as do most psychiatrists) only suitable for a certain class of harmless and chronic cases, for which, under careful supervision and restriction, they may, however, prove a welcome addition. (3) Institutions for abnormal and insane children, the proper organization of which he considers one of the most imperative tasks of present day psychiatry. (4) The care of the criminal insane. (5) Asylums for alcoholics. (6) State care for the nervous but not insane. (7) What he calls "social psychiatry," under which he includes the reform of legal procedures concerning the insane, after-care of convalescents, and proper arrangements for free advice to those who are liable to become insane or think that they are. (8) Registration and study by the state authorities of all the insane within its borders.

3. *Status Epilepticus and Treatment with Atropine Sulphate.*—In status epilepticus the author thinks the important element the condition of the heart and how far it is able to stand the strain thrown upon it by the repeated convulsions. Excessive weakness and rapidity of the pulse marking for him the severe case. On this account all remedies which depress the heart must be exhibited only with extreme caution.

The removal of all external sources of irritation, the ice bag to the head and free purgation by injections of castor oil, with large doses of bromides by the mouth or by the rectum may control the moderately severe cases. Each drug of the group of sedatives has its partisans, but the author prefers amylene hydrate and dormiol in full doses, the heart being sustained by the digitalis or strophanthus preparations. The ideal drug, however, is one which has a strong influence in controlling the convulsions and at the same time does not depress, or better stimulates, the action of the heart. This the author thinks he has found in atropin in large doses to which he ascribes the following results: (1) The narcotic effect exceeds by far that of any safe dose of morphin; severe pain is dulled and sleep ensues. (2) The heart is stimulated. (3) The peristalsis of the intestine is regulated. It is not dangerous.

He has used the drug in doses of from 0.003 to 0.006 (grs. 1–22 to grs. 1–11) every eight hours (hypodermatically) and has seen surprisingly good effects, all his cases being benefited, the majority apparently rescued from impending death. Histories of eleven illustrative cases are given. He feels justified in concluding that atropine sulphate, in doses three to five times the usually stated maximum dose, is well borne by epileptics (even the juvenile ones) and is able to cut short the attacks and to ward off a fatal issue, acting as a heart tonic at the same time. It may well be combined with other antiepileptic remedies and its combination with amylene hydrate has seemed to him a particularly happy one.

4. *Salvarsan in Psychiatry.*—The author gave salvarsan by subcutaneous injection in doses of from 0.4 to 0.6 in seven cases of general paresis, one case of cerebral syphilis and in 5 cases of functional psychoses, in which there was a history of syphilis in the past. While in the paretics there was some temporary improvement, and in all, any skin or bone lesions which happened to be present cleared up, in none could he see any decided and permanent mental improvement which could be attributed to the salvarsan alone.

C. L. ALLEN (Los Angeles).

Journal of Mental Science

(Vol. 54, No. 224. January)

1. Amentia and Dementia; a Clinico-Pathological Study. JOSEPH SHAW BOLTON.
2. Observations on the Opsonic Index to Various Organisms in Control and Insane Cases. C. J. SHAW.
3. Redicivism Regarded from the Environmental and Psycho-Pathological Standpoints. J. F. SUTHERLAND.
4. Some Notes on Status Epilepticus and its Treatment. A. BANKS RAFFLE.
5. On the Treatment of Cases of Acute Insanity by Rest in Bed in the Open Air. J. WIGLESWORTH.

1. *Amentia and Dementia.*—Part III, Dementia. A continued article.

2. *Opsonic Index in Insane Cases.*—The indices of five control cases (sane) and fifteen insane patients to the *B. coli communis*, *Staphylococcus aureus* and *Micrococcus rheumaticus* were examined for five days before the injection of Koch's neutuberculin T. R. was given and for some days thereafter. No diagnosis of the insane cases is stated beyond the fact that seven were considered acute and eight chronic. The author's conclusions, as stated by himself, are as follows: (1) The average opsonic index of healthy persons varies little to different organisms but in the insane the index, as a rule, is lower than in sane individuals, and the amount of variation greater and therefore the insane as a class are more liable to organismal infection than the sane healthy population. (2) After the injection of a large dose of Koch's neutuberculin T. R. a negative phase may follow to other organisms than the tubercle bacillus, but this result is more frequent in the insane than in control cases. (3) Persons suffering from acute mental disease are more liable to organismal infection than more chronic cases, but the latter have less resistive power than sane healthy individuals. (4) The insane are more liable to tubercular infection than to infection by other organisms.

3. *Recidivism.*—Continued article.

4. *Status Epilepticus and its Treatment.*—Treatment by hyoscine hydrobromate is favored, which, it is asserted, in carefully regulated doses, will diminish the mortality.

5. *Treatment of Acute Insanities.*—The author's cases are in bed out of doors from 8:30 A.M. to about 6:00 P.M. all the year around except during the winter months. This treatment will benefit almost all cases, especially active mania, melancholia and stuporous cases. The practice of keeping all patients out in the open air as much as possible improves the general health and has reduced the death rate to an appreciable degree.

W. C. SANDY (Kings Park).

L'Encéphale

(Sixth year. No. 3. March, 1911)

1. Deliria of Imagination. Dupré and Logre.
2. Remarks upon Apraxia, referring to a Case followed by an Autopsy. Dr. M. Bornstein (Warsaw).
3. Sensory Disturbances in Morphinomania, Cocainomania and Heroinomania. A Barbé and E. Benoist.

1. *Deliria of Imagination.*—(Continued article. Vide No. 4.)

2. *Apraxia.*—The notion apraxia comprises every soil of disturbance transpiring in a motor act which is not dependent, on the one hand, upon mental disease in the strict sense nor, on the other, upon a paralysis, an incoördination nor an inability to recognize objects. Apraxia therefore occupies the same place in the pathology of movements that aphasia does in the pathology of speech. Numerous authors have within the last ten years drawn attention to these phenomena without giving any concordant explanation of them. They have invented a number of terms to explain them but are not in concordance as to the meaning of the terms. Finkelberg invented the term *asymoblia* to explain the loss of the power to recognize the meaning of signs or symbols, the sign of the cross, etc. Wernicke applied this word especially to the loss of the power to recognize objects and identified it with the loss of power to form images. Freud designated this disturbance *agnosia,* while Kussmal, Starr and Pick introduced the term *apraxia* to designate the incorrect handling of objects, which was due, according to the notions of that time, to the inability to recognize the objects.

In 1890 Meynert propounded the conception of a pure motor form of asymbolia as distinct from the sensory form of other authors, *e. g.,* the agnosia of Freud. The solid foundation of the present conception of apraxia was laid by H. Liepmann in his work "Das Krankheitsbild der Apraxie," which appeared in 1900, by the analysis of the celebrated case of the counsellor of state, a man 48 years old who presented a motor aphasia and motor disturbances of the right hand which he designated apraxia.

The patient was unable to execute *intentional* movements with the right hand properly, although he could do so perfectly with the left hand, even writing (*en miroir*) with the latter. Accustomed *not intentional* movements such as he had been in the habit of doing without giving them a thought as it were he could also perform with the right hand. From this Liepmann deduced that there was a motor apraxia in every way analogous to motor aphasia. To summarize: "The sensory and motor domain of the members of the right side were to a certain degree isolated from the rest of the brain; the communications between the centers corresponding to the members of the right side (left hemisphere) and the other motor centers of the brain were insufficient." Therefore he concluded that there was a focus of destruction in the left hemisphere commencing at the third frontal convolution, extending across the island of Reil (motor aphasia), *sparing the sensitive motor center,* but destroying the white substance as far as the superior parietal and supramarginal gyri. Several years later this hypothesis was confirmed by an autopsy.

Heilbronner recalled cases of Bonhoeffer and Knapp in which the motor disturbances affected movements to which the patient was accustomed by long habit as well as the intentional movements affected in Liepmann's case. He therefore carried the analogy with the aphasias still further by designating these *cortical* and Liepmann's *transcortical* or *paracortical.* Kleist denominated this *apraxia innervatrix.*

Later Wernicke elaborated an hypothesis of an apraxia, which was still further developed by Kleist and Liepmann, involving more the receptive and associative end of the arc and covering in a measure the asymbolia and agnosia previously mentioned, under the name of *associative apraxia* or *apraxia ideatrix*

It is under the latter heading that the author classifies the case of which he gives a detailed history and analysis.

Unfortunately for the scientific value of his conclusions there was a complex of other mental disturbances as well as a partial hemiplegia and the autopsy showed but a general cerebral degeneration without any marked foci of destruction. His conclusion, however, is that in apraxia ideatrix the lesions are general and diffuse in contradistinction to the motor aphasias where they are localized.

3. *Sensory Disturbances in Morphinomania, etc.*—The authors giving a history of several cases conclude: (1) The kind of toxic substance has no influence upon either the time of appearance or the intensity of the sensory disturbances. (2) The sensory disturbances do not seem to have any relation to the quantity of the toxic substance absorbed. (3) The mode of absorption has little if any influence on the sensory disturbance created, although the subcutaneous path of entry seemed to favor the appearance of sensory troubles. (4) The time elapsed since the first commencement of the intoxication has a manifest influence upon the appearance of sensory disturbances. (5) It does not seem that the addition of another substance to the toxic one habitually used has any influence upon the appearance of these disturbances.

In conclusion: Sensory disturbances in morphinomania, cocainomania and heroinomania are very slight. The disturbances usually noted are: A retardation or diminution of the pain sense; heat and cold are exceptionally diminished. Deep sensibility is unaffected.

W. C. Herring (New York).

Journal de Psychologie normale et pathologique

(Ninth Year. No. 4. July–August, 1912)

1. The Messiahship of a False Dauphin. P. Serieux and J. Capgras.
2. The Mental Processes of a Poetical Genius, Victor Hugo. N. Kostyleff.

1. *The Messiahship of a False Dauphin.*—A long biographical account of Naundorff, showing what influences, subjective and objective, led him to declare that he was the Dauphin of France and the Messiah. Intense suggestibility resulting in a subconscious delirium of imitation is the author's explanation of this singular individual's claims and performances.

2. *The Mental Processes of a Poetical Genius, Victor Hugo.*—(Continued.)

(Ninth Year. No. 5. September–October, 1912)

1. A Contribution to the Study of the Syntheses, Particularly that of Color Hearing. G. Marinesco.
2. Experimental Telepathy in So Far as the Phenomenon is Cryptomnesic. E. Abramowski.

3. The Mental Processes of a Poetical Genius, Victor Hugo. N. Kostyleff.

1. *A Contribution to the Study of the Syntheses, Particularly that of Color Hearing.*—The mental association of certain colors with particular letters, words and tones is not uncommon. It underlies much of the beauty and poetry of language. It inspired Rimbaud's famous sonnet upon the vowels. As a mental phenomenon it has awakened the liveliest interest among physiologists, psychologists and clinicians. There is an extensive literature upon the subject from which Marinesco has drawn freely in the preparation of the present essay.

Many theories, of which the author presents four, have been advanced to explain the phenomenon.

1. The syntheses, such as color hearing, are the results of an incomplete differentiation between the sense of vision and that of audition, or to speak more accurately, between the cortical centers subserving these senses. It is a manifestation of atavism, a relic of the time when the separation of these various special senses had not yet been fully accomplished. This hypothesis rests upon an embryologic basis.

2. Some authorities believe that there may exist among the individuals who experience these syntheses special interconnections between the centers of sight and hearing, anastomoses, as it were. determining the mode of action of the hearing, say, after an auditory perception had put it immediately into connection with the visual center and thus awakening the color sensations. According to this view these photisms should be frequent among the less civilized peoples.

3. Fechner's theory involves the idea of nervous irradiations. Excitation of one sense provokes the activity of the other senses. This of course depends upon the particular area excited and it varies with the intensity of the sensations provoked and consequently with the peculiar traits of the individual.

4. The explanation of Flournoy is popular and is founded upon the notion of privileged associations. The association of two representations is not brought about by merely the regular and frequent conjunction of them in the field of consciousness but by the similarity of their emotional characteristics.

Marinesco cannot bring himself to accept this last hypothesis. Like the vast majority of authors who have studied the question, he thinks that the syntheses, at least all those that are known, are nothing else than psychological exhibitions having their localization in certain centers of the cortex and are revelations of the individual's own psychology. They are the expression of a very common phase of mentalization which differs, however, in intensity and in quality in different individuals and is related to the greater impressionablitiy of the centers for the sound of words and of those for mental vision.

An extensive bibliography follows the article, and a group of colored illustrations.

2. *Experimental Telepathy in So Far as the Phenomenon is Cryptomnesic.*—(Continued.)

3. *The Mental Processes of a Poetical Genius, Victor Hugo.*—This is a study of how Victor Hugo worked in creating his great poems. The author seems to assume that it is the same with all the poets and hence that it is the method of the genius of poetry. He says he does not pretend to have touched upon everything that constitutes the essence of poetical genius. The brain is a living mechanism whose functionating

varies infinitely. He believes he has shown that the linking together of memories with the data of facts varies according to the personal factor, according to the nature of the material, according to the model selected, etc. It varies according to the taste, the temperament and the esthetic sensibility of the author. But without assuming a definitive solution of the problem, he thinks he has uncovered one of the most essential factors in the mental methods of a poet. What interested him above all things was not the composition of the poem but the gathering of the material for it. He feels he has demonstrated that the marvellous wealth of material entering into the contents of the great poems of Victor Hugo came from contact with external excitants. If this be so the genius for poetry loses a great deal of its mysteriousness and shows again that it is only a mode of cerebral reflex action.

(Ninth Year. No. 6. November–December, 1912)

1. The Psychology of August Strindberg (1849–1912). DR. LUCIEN LAGRIFFE.
2. Hallucination and its Various Clinical Forms. Hallucinations of Hearing in the Systematized Psychoses. Systematized Hallucinatory Delirium. DR. RENÉ MASSELON.
3. Experimental Telepathy in So Far as the Phenomenon is Cryptomnesic. E. ABRAMOWSKI.

1. *The Psychology of August Strindberg (1849–1912).*—A long and most interesting biographical and psychological study of Strindberg who, with Ibsen and Bjoernson, was, as the author says, one of the most remarkable personalities in Scandinavian literature.

2. *Hallucination and its Various Clinical Forms.*—Masselon here studies (*a*) the characteristics of a hallucination, (*b*) its mode of development, (*c*) the mental state of the victim of it, and (*d*) the nature of it at the conditions of its genesis.

The chief conclusion arrived at by the author is that many different phenomena are grouped under the head of hallucinations and that the latter represent disturbances of the judgment.

3. *Experimental Telepathy.*—This is an attempt to explain upon physiological grounds what is called thought transference. The article is so long, so full of statistics, so indefinite in its conclusion that it cannot well be put into the form of an abstract.

METTLER (Chicago).

MISCELLANY

INCONGRUOUS SYMPTOMS IN HYSTERIA. B. R. Tucker. (Journal A. M. A., November 23.)

The author calls attention to the difficulties met with in the diagnosis of some cases of hysteria. He quotes from neurologic literature showing the different statements that are made in regard to various characteristic symptoms. "Mills thinks that true astereognosis, loss of the sense of position, true ataxia and hemianopia are not found in hysteria. Purves Stewart states that in hysteria absent knee-jerks, incontinence of bladder and rectum and the Babinski phenomenon never occur. Babinski himself says that hysteria itself is incapable of modifying tendon-reflexes. Dana says that the sphincters are never involved except temporarily or through some complication. Incontinence of feces never occurs, according to Grainger and Stewart. Philip Coombs Knapp gives an excellent biography of the reflexes in hysteria and says that the Babinski and Oppenheim reflexes are never caused by hysteria. Tendon-reflexes may be exaggerated within normal limits. Whether hysteria can give rise to ankle-clonus or loss of knee-jerks is doubtful. Knapp also says that total paralysis and total anesthesia on one side are very rare. He says that Crocq believed he had found ankle-clonus and patella-clonus in hysteria, and was supported by Charcot, Sachs, Oppenheim and others; and loss of knee-jerks has been found by Steiner, Marye, Nonne, Wigand and Charcot. Complete absence of plantar reflexes has been noted by Knapp and other observers. Mills states that Van Gehuchtan has reported one case with the Babinski phenomenon and ankle-clonus which disappeared in a few days." The whole outcome of the case, Tucker says, may thus hinge on the view we take of certain symptoms. Hysteria is a less frequent diagnosis, however, than was formerly the case, which is fortunate. Tucker reports four cases, one with pseudo-aphasia, another with loss of sphincter control, another with unilateral amblyopia and still another with absent knee-jerks, all of which examination and subsequent history proved to be clearly hysterical. He has other less striking cases that he might report, but these are sufficient to illustrate the points he makes.

ALCOHOL PARALYSIS. L. Friedman. (Journal A. M. A., November 23.)

A rather unusual case of temporary paralysis and amaurosis following the injection of ethyl alcohol into a chronic empyema sinus is reported by the author. The patient had received previous injections of 95 per cent. alcohol without untoward symptoms, but suddenly after one of them became perfectly limp and flaccid and unconscious for a few seconds, both upper and lower extremities being paralyzed. Loss of vision was complete except as to light and darkness, but cutaneous sensation was present. The mind was clear, speech normal, no cyanosis, pupil reaction normal to light, knee-jerks exaggerated. Motion slowly returned and the paralysis disappeared entirely in half an hour; the vision also slowly improved and was perfect in about three days. Ophthalmoscopic examination half an hour after the attack showed only slight congestion of the fundus. Friedman has been unable to find any other record of pure ethyl alcohol amaurosis.

NON-EPILEPTIC CONVULSIONS. A. C. Brush. (Journal A. M. A., November 16.)

The difficulties in differentiating convulsive seizures of toxic origin from those of genuine epilepsy are discussed by the author, who mentions four cases in which such seizures occurred, apparently in connection with the menstrual function. Though the term epilepsy has been used for a thousand years or more, the accounts of it are not absolutely clear, and the difficulty of distinguishing between hysteria and epilepsy is often complicated by the coexistence of the two conditions. The pathognomonic symptoms that have been claimed for epilepsy are far from being constant or truly such. In the cases mentioned the seizures first appeared after an unusual exertion or shock in two of the patients, and he considers that in all they were due to gastro-intestinal disturbances and menstrual stress on the nervous system. The patients had, he thinks, a previous irritability of the cerebral cortex. The function of menstruation caused exhaustion of the pelvic and abdominal nervous mechanism; the consequent disturbance of the abdominal viscera led to the production of toxic substances which, acting on the cortex, produced the convulsions. Treatment based on this theory proved most satisfactory.

THE URINE IN NERVOUSNESS. E. B. Angell. (Journal A. M. A., November 16.)

The author calls attention to a urinary reaction which he has observed for a number of years as an indication of toxemia. It consists in the formation of a dark pigment ring in place of the white ring in the Heller test. It varies from a dark brown to a bright red color and the easiest method to show it is to take a test-tube partly filled with the suspected urine and plunge a pipet loaded with pure nitric acid to the bottom of the test-tube; the finger covering the top of the pipet is then slowly released and the acid gradually replaces the urine at the bottom of the tube. The contact line between the urine and acid is sharp and well defined. The chemistry of this ring he is unable to give. It is certainly, he says, not due to indican or bile. The urine in these patients is specifically acid, as a rule, and of a relatively high specific gravity. A somewhat similar color ring is seen in the urine of patients taking potassium iodid but he does not think the two are likely to be confused. He has also noticed a marked color ring in exophthalmic goiter. Whether the thyroid disorder has any relation to the metabolic change in these cases he cannot say, but he has found this pigment ring here described in all nervous cases of a certain class. The characteristic symptom is one of depressed nervous action. Complaint is made of dull headache, restlessness, sleeplessness, vertigo, backache, etc., and general good-for-nothingness. The patients are more or less hypochrondriacal, self-conscious, emotional. They are sallow, have distended abdomens and coated tongue and lack energy and initiative. At times the condition simulates the more grave organic maladies, but it is wholly a functional disturbance. When corrected by a proper diet and elimination through the free use of a salicylate and an alkali the cases generally clear up, sometimes in a few weeks, but in some obstinate cases a much longer period has been required.

HEREDITY IN NERVOUS DISEASE. C. B. Davenport. (Journal A. M. A., December 14.)

The author says that mental abnormalities may be divided into two sorts—lack of development and weakness. Modern studies in heredity indicate that typically each part develops to a certain extent independently of any other, at least in the early stages. Later development is affected by the internal secretions of a number of organs. Finally, insufficient nutrition of the embryo, or the presence of certain poisons, may have an inhibiting effect. Failure of mental development may be regarded as of four sorts: (1) intrinsic and general, producing idiots and cretins; (2) intrinsic and specific, producing the feeble-minded; (3) extrinsic and general, resulting, it is said, in abortions, miscarriages, etc.; (4) extrinsic and specific, causing, perhaps, some cases of harelip and other bodily defects. Of the four classes the second is the most important and frequent. Davenport considers feeble-mindedness, the failure to develop specific mental traits, the determiners for which are not present in and have never been acquired by the germ plasma. It is the reversion to the characters of our ape-like ancestors before they acquired these traits.

The feeble-minded have gained most human traits but still lack some mental ones. The group of the mentally weak includes those who under the influence of stress suffer mental breakdown. The stress reveals the hidden weakness but does not cause it. Everyone has his weakest point; in some it is in the brain and such include those that go insane. Feeblemindedness is the simple cropping out of inherited animal traits. Considering these cases in relation to society, he criticises society's treatment of them as inadequate. We cannot hold them as responsible or as deserving punishment in case of wrongdoing, and such punishment will have little deterrent effect on other similar cases. Lifelong restraint should be the treatment, as in the case of the imbecile and the permanently insane. The prevention of the propagation of these infirmities by unfit matings should not be allowed, and Davenport strongly protests against the obligation of medical secrecy in this regard. A knowledge of such traits when existing is due to society. If physicians must protect those by whom they are paid, even at the expense of society, then the sooner the state takes over the whole matter of private as well as public sanitation the better. He believes that eugenics should be recognized as one of the principal divisions of state sanitation.

INTRADURAL SPINAL ROOT ANASTOMOSIS. C. H. Frazier and C. K. Mills. (Journal A. M. A., December 21.)

The authors report a case, the first so far as they know, of the operation of intradural anastomosis of the first lumbar to the third and fourth sacral spinal nerve root successfully accomplished for the relief of paralysis of the bladder, and discuss the application of the same method to the other paralytic affections. The patient had suffered a severe traumatism from the explosion of a gas tank, at first causing complete paraplegia, including incontinence of urine and feces. In a few weeks the paraplegia and accompanying anesthesia largely disappeared, but the patient was left with an absolute incontinence. Seven weeks after the operation he reported slight improvement, and in a note received since the preparation of the paper, he reports that the improvement had markedly advanced. The identification of the various roots by faradization was simpler than had been anticipated. The anastomosis was effected on the left side only. The authors describe the nerve-supply of the bladder and make some practical suggestions in regard to the operation. In future cases they will make sure of the position of the vertebræ by the x-ray before the operation and, as suggested by Dr. E. M. Williams, have the bladder filled with boric solution and a small manometer connected with the catheter so as to aid the identification of the sacral nerve roots when stimulated. They found the method of administering the anesthesia by intratracheal insufflation safer and more convenient than the drop method. To avoid the harmful influence of manipulation of the nerve roots and to prevent shock-producing tendencies, they established a block by applying 4 per cent. stovain solution to the cord just above the site of their manipulations. As regards the application of the operation to other paralytic troubles, they give a table of possible anastomoses of nerve roots as deduced from studies on the cadaver. It is in paralysis of the bladder and rectal sphincters, however, that they see the greatest indication for the method. Owing to the shortness of time that has elapsed since their operation, they submit their paper as a preliminary report.

CYANOSIS IN DEMENTIA PRÆCOX. W. B. Cornell. (Journal A. M. A., December 21.)

The author has studied 241 patients with dementia præcox in the Danvers Hospital for the Insane, and found 78 per cent. to show some grade of cyanosis, from a mild degree to an extreme dusky purple. It was usually most marked over the dependent parts, yet the skin as a whole is often bluish, especially on the upper back. The relative frequency of the involvement of the hands, feet and back is as 9:6:5. It may occur on the feet and not on the hands, and is sometimes most marked on the face and lips. It varies from day to day without regard to position or temperature. In the catatonic form, 90 per cent.; in the hebephrenic type, 75 per cent., and in the paranoid, 50 per cent., were more or less cyanotic, and the intensity varies in the same order. The symptoms have some prognostic significance, the worst cases becoming most rapidly demented. Acute catatonic excitement with marked cyanosis forecasts grave danger of collapse and death. It may serve also to differentiate between dementia præcox and acute manic insanity, in which it is exceptional. He also thinks it would be of use in the differentiation of imbecility from dementia præcox. As to the nature of this cyanosis, he does not find it dependent on blood-pressure, but it is certainly a vasomotor indication. He sums up as follows: "A cutaneous cyanosis is found in a large majority of dementia præcox cases, most frequently and intensely in the catatonic form, next in order in the hebephrenic and then the paranoid. It is part of a generalized vasomotor disturbance, consisting in a phlebostasis of unknown origin. Cyanosis is variable within large limits, even in the same patient. Cyanosis offers a valuable diagnostic sign in differentiating dementia præcox from manic-depressive insanity, imbecility, hysteria, constitutional inferiority and occasionally the organic psychoses."

PREDEMENTIA PRÆCOX. W. R. Dunton, Jr. (Journal A. M. A., December 21.)

Dunton takes up the early features of that type described first by Jelliffe as predementia præcox. The predementia state is the early stage where the possibility of arrest of disease is greatest. Usually an "outbreak" of some sort calls the attention of the family or friends to the condition but some time elapses before proper treatment is instituted. Dunton admits that the diagnosis may often be difficult but he has found a much abbreviated association test to be of considerable value. He quotes from Jelliffe and Meyer as to the symptoms and types of the conditions and the importance of recognition of these subjects by physicians and teachers. We all know children who have done well in their studies up to a certain point, after which mental failure has begun. Some of these cases may be due to overwork and the question of their prevention is an important one. Under ideal conditions every school should be under the observation of a specially trained psychologist, as well as a physician, to oversee the physical and mental welfare of the pupils, and many cases would even then slip by. Dunton emphasizes the value of the Binet test in these early cases which are rarely seen by the alienist until after the patient is suffering from an acute mental attack. The opportunity of their recognition comes first to the teacher, next the family physician, later, perhaps, the neurologist, and lastly, the mental specialist. Occasionally a case comes under his care in the prodromal period and he may be so fortunate as to abort it. After the acute attack much can be done by reeducation, especially along the lines of manual training, even if perfect restoration to normal is impossible.

POLIOMYELITIS. H. F. Langhorst. (Journal A. M. A., December 28.)

The author calls attention to a possible means of transmission of anterior poliomyelitis which may be of some importance, but has not thus far received much notice. We know of one certain source, the biting stable-fly, proved to be an intermediary by Rosenau whose results have been confirmed by Anderson and Frost. This fly bites animals, as well as men, among them the dog, which may be the active carrier of the virus in the secretions of his nose and mouth for a considerable time. Dogs are numerous in countries which have suffered most from poliomyelitis, and they are also most numerous in the country districts where the disease is most prevalent. Two cases are reported favoring the view that the disease was transmitted through the dog. In one, the dog had been sick and unable to stand on its hind legs. The patient, a man aged 35, had cared for him and allowed it to lick his hand on which were some slight abrasions. In the other case a boy of 6 years had been treated for a bite inflicted by a pet dog and several weeks later had contracted the disease. The diagnosis was favored or confirmed by other physicians in each case.

SARCOMA OF THE BRAIN. B. M. Randolph. (Journal A. M. A., January 4.)

Randolph gives a full history, with autopsy findings, of a case of sarcoma of the left frontal lobe of the brain. The lesion was clinically diagnosed in the above situation, but its nature was not determined, and the opinion was that it could not be a tumor from the lack in the history of progressive development. A few days before her death the patient passed suddenly into stupor, followed by some slight convulsive symptoms. Death occurred apparently from medullary paralysis. The points of interest, as stated by the author, are: its indication that rapidity of development or a clinical picture pointing to destructive brain lesion is not to be taken as evidence against tumor. Such a growth may not show symptoms for some time, and then suddenly become active by rapid infiltration, metastasis or occurrence of collateral brain disturbance. The question of operation is also a matter of interest. The usual teaching is to operate in case of brain tumor unless there is positive contra-indication. In this case the findings showed that it would have been futile. A transient hemiplegia that occurred at the final attack can be accounted for by the brain softening found, but there may have been also other factors. A frequent epistaxis from which the patient suffered seems to Randolph more than a coincidence, and he suggests a possible connection between it and the tumor. The cause of death seems to him obscure. There was no heart, lung or kidney infection, and no lesion could be found after careful search in the medulla or its environment, though death was apparently due to medullary paralysis.

DYSTROPHY OF HAIR AND NAILS. J. S. Eisenstaedt. (Journal A. M. A., January 4.)

Three new cases of hereditary family dystrophy of hair and nails, identical with the two previous cases reported, are here reported. The patients are three brothers, the third, fifth and eighth children in a family of eight, seven of whom are living and in good health. None of the other children were ever affected. The father shows no peculiarities, nor, as far as has been learned, have any of his ancestors. The condition has existed in four previous generations on the mother's side, the mother, the grandfather, great-grandmother and the great great-grandmother. It would appear that the disease was not sex-confined. There are probably other collateral branches of the family affected, but definite knowledge of them is lacking. A minute description is given of one of the cases. Microscopic examination of the individual hairs showed nothing abnormal. There were no parasites, nodes, rings, air bubbles or splitting of the extremities. The growth was short—not over 2½ inches—though there had been no recent hair-cutting. There seemed to be some anomaly in the implantation. In the previously published reports mental deficiencies and paronychiæ have been noted, but these were absent in these patients as far as could be determined. In one of the three patients the presence of the thyroid cannot be determined. The possible relationship between the family dystrophy of the hair and nails and acanthosis nigricans occurred to the author, and one of the patients shows the peculiar papillary hypertrophy not unlike that observed in that disease. Another suggestive fact is, that the mother, also affected, died of some malignant abdominal growth after the birth of her youngest child. Eisenstaedt thinks that a better understanding of general metabolism, and especially of the internal secretions, will be needed to clear up the obscurity at present existing in regard to these conditions. The article is illustrated.

HEMIPLEGIA WITH CONTRALATERAL OPTIC ATROPHY. W. B. Cadwalader. (Journal A. M. A., December 21.)

The author gives the history of patients observed in the service of C. K. Mills and J. K. Mitchell at the University and Orthopedic hospitals in which the coincidence of optic atrophy with contralateral hemiplegia was observed. There was in one right motor aphasia and spastic paralysis of right arm and leg, while in the left eye there was evident occlusion of the central artery of the retina. Previous cases published by Gowers, Jackson and Batten and Guthrie have shown that an embolism may be carried through the internal carotid into the middle cerebral artery and at the same time send off a portion into the ophthalmic artery and even into the central artery of the retina, causing sudden blindness and atrophy. In both the cases reported the loss of vision was not immediate and in one of them there was probably a localized endarteritis preceding the sudden attack of paralysis.

PARANOID PSYCHOSIS. N. S. Yawger. (Journal A. M. A., December 21.)

The author describes a case of megalomania with jacksonian convulsions, clinically resembling a somewhat aberrant case of paresis, which, however, the author rules out on account of the strictly localized meningeal and cortical involvement. The lesions were confined to the parietal region, but an exact convolutional limitation is not given. The history also was very defective. There was no history of syphilis, but there was enlargement of the inguinal glands and unequal pupils. The microscopic appearances are described and the syphilitic origin is strongly suggested. No Wassermann test was made. Syphilitic paranoid psychoses are probably very frequent.

Book Reviews

ANLEITUNG ZUR FUNKTIONSPRÜFUNG DES OHRES. Von Dr. A. Sonntag und Dr. H. J. Wolff. Mit einem Vorwort von Prof. Dr. G. Brühl. S. Karger. Berlin.

This is an extremely useful short descriptive account of the more practical methods of testing the functions of the ear. Both the cochlear and vestibular nerve functions are considered in as much detail as 70 well chosen pages will permit. To the neurologist a short account like this will prove of much service as the functional testing of the ear has become of increasingly greater significance in neurological work.

DER SCHWINDEL (Vertigo). Zweite Auflage neu herausgegeben und bearbeitet von J. Rich. Ewald, Strassburg, und Robert Wollenberg, Strassburg. Alfred Hölder, Wien und Leipzig.

This new edition of Hitzig's original study on vertigo has been amplified chiefly by the addition of the rich material obtained in the study of labyrinthine vertigoes. It brings the subject of the various types of vertigo well to the present limits of what is known concerning them. The study of cerebellar and labyrinthine vertigoes is especially full and of value to the neurologist. The whole subject is moving very rapidly and the phase represented by this monograph will soon pass. The subject needs a more thoroughgoing version than the present one but this cannot be avoided in a field where active research is conquering new facts almost daily.

JELLIFFE.

A SYSTEM OF TREATMENT. 4 vols. Edited by A. Latham and T. Crisp English. The Macmillan Company, London and New York.

This system, in four volumes, sketchily treats all human ills. Many famous men have contributed to it, much labor has been expended in compiling and editing it; but, in spite of the excellency of both editors and contributors, these volumes will have a hard task to justify their existence.

The separate articles are too many even to be enumerated here, far less reviewed. They contain much that is instructive, but little that is not already available upon every practitioner's bookshelf.

Dr. Mitchell Bruce enunciates briefly the principles of treatment in the clear manner which he has made familiar in his excellent text book; Dr. Eustace Smith writes sparingly but charmingly upon the feeding of babies; and others give a précis of subjects upon which they have already written authoritatively. But, except for a few brilliant articles, the internal medicine section is not satisfactory. An unending tale of so-called remedies usually follows each disease. Data regarding the efficacy of the various procedures are rarely given. All available drugs, baths and other measures are generously offered, and the reader takes his choice. Surely there ought to be an end to this traditional slipshod method of presentation. Exact information may not always be procurable, but when it is, it should be given. The treatment of heat stroke, for example, has been very carefully studied here in New York. Various physicians have practised special methods, and have tabulated the result of these methods. That devised by O'Dwyer has been shown to reduce the mortality to about 7 per cent. Baruch and other authorities have acknowledged that O'Dwyer's method has proven to be without peer. Yet, Sir Havelock Charles epitomizes here a method which he considers the method, which rests only upon his authority, of which the results are a matter of faith, and which ranges from blocks of ice to chloroform. It may be an excellent method, but, as it is presented, one would require the credulity of a Christian Scientist, or a Papal Bull establishing the infallibility of the learned knight, before one could conscientiously practise it upon a patient. If Sir Charles had stated his method, and substantiated its value by quoting his case mortality, then one could judge between it and any other method which one already knew.

An excellent paper on typhoid fever by Reid Roberts, one of the best articles on this subject, in this or any other system, errs similarly in discussing the usefulness of the various temperatures at which the Brand (?) bath is employed.

Pellagra, by Sandwith, is not instructive. "At my instigation," "I have found," etc., unpleasantly recall the author's "Diseases of Egypt."

Briscoe states that "Inhalation of oxygen in broncho-pneumonia, although theoretically of great value, is practically of little value" (p. 1071, Vol. 1). This is a refreshing variant of an old theme. Theoretically the practice is indefensible. The only effect of oxygen inhalation is to increase the amount of dissolved oxygen in the plasma: it cannot influence the amount which unites with the hemoglobin, for oxy-hemoglobin being a chemical compound must have a constant composition.

Caiger and Cuff, writing on typhus fever, seriously advocate "Should the patient be wildly delirious he may be restrained by fastening a sheet across him, but if this fails, he must be tied down in bed." This relic of barbarism apparently has survived typhus fever in England.

Dr. Spitta, who perhaps had the rare fortune to see the only case of rabies which has occurred in England during this century, states that it is regrettable that the Pasteur method of treatment cannot be obtained in England. His remark is aggravated by the fact that this case, a soldier bitten in Gibraltar, received the Pasteur treatment six months before he died rabid in England. Dr. Spitta, to lighten the reader's labors, recommends: "When a person has been bitten by a rabid animal, under no circumstances should the animal be destroyed off-hand. It should be kept under close observation. It is of great importance that the nervous system of the suspected animal, packed in ice or immersed in glycerine, should be sent with the patient to the nearest Pasteur Institute" (p. 265, Vol. 1). Is it not our duty to focus the attention of the various antivivisection societies upon Dr. Harold Spitta? Under no circumstances to destroy, but to keep under close observation, an animal whose nervous system has been packed in ice is surely a monstrous and revolting suggestion.

Dr. James McKenzie's contribution on the heart is a model of what an article on treatment ought to be. Its only fault is that there is not enough of it. By the clearness of expression, and orderly arrangement of facts, he convinces his readers that the conclusions he reaches are logically inevitable. Here we have all the available scientific data as the basis of our therapy: here we are freed from the eternal "Some recommend this," "I use that," "So and so is useful." McKenzie has discovered that a physician may be a thinking being. He does not ask one to wander with him blindly through a maze of remedies. One quotation from this article might be made. "In like manner, strychnine has of late years come to receive such an amount of commendation, that the belief in its efficacy amounts almost to a superstition. Yet, given in medicinal doses, it is absolutely without detectable effect upon the heart or blood vessels experimentally, or in the human subject. No great harm might accrue to these beliefs were it not that it leads to the perpetuation of methods of treatment which are vain and valueless. Positive harm does actually occur, for in cases of serious heart failure, the belief in these ineffective remedies leads to their employment in grave conditions, and to the neglect of more efficient measures, so that the patient's life may be put in jeopardy, if not sometimes sacrificed" (p. 1199, Vol. 1).

R. A. Young, in the article on Congestion and Edema of the Lungs (p. 1079, Vol. 1), discussing measures to improve the strength of the heart, states: "In cases where digitalis fails, or more rapid effects are required, hypodermic injections of strychnine may be of great value in doses of 1.50–1.30 gr. every four or six hours." Surely the publishers might advantageously bestow a few marked copies of the system on some of the collaborators.

Hale White, in his article on Pneumonia, says: "Strychnine appears to be particularly useful in severe cases of pneumonia, *probably because it acts not only on the heart,* but also because it is a powerful respiratory stimulant" (p. 260, Vol. 1). "The inhalation of oxygen gives great relief to many sufferers from pneumonia, even if they are not livid, but it gives still greater relief to those who are livid" (p. 261). When one looks for the experimental basis of this method, or for the results which justify the faith of Dr. Hale White, one finds: "Some are sceptical as to the advantages of oxygen but, on the other hand, an intelligent man told me once that inhalation of oxygen made him feel so much better, it was like taking a glass of champagne." Such serious endorsement of a therapeutic measure is incomplete without the portrait of the intelligent man! Does oxygen now belong to the category of patent medicines? Intelligent patients always testify to these, but we are shown their portraits that we may ourselves judge of their intelligence. And observe, Dr. Hale White was told only once, and by a man to whom alcoholic beverages were familiar.

It is worthy of note that the treatment of pneumonia occupies only one and a half pages less than the treatment of tumors of the spinal cord.

We must thank the editors for the privilege of the introduction to Miss McCall Anderson, and we offer her our congratulations upon the "Management of a Sick Room." It is one of the few cases in this desert of print.

The less said about the obstetric section the better. Conyers Berkley, writing on abortion, runs off the perennial list of indications. He states—what is evident—that he makes no attempt to discuss the pros and cons. Why does he give the stupid list, unless to satisfy editorial hunger. The article abounds in commonplaces. "The practitioner should for obvious reasons be most careful never to induce abortion without first having a consultation with another doctor" (p. 433). Why not? Are all practitioners so ignorant that no one alone can tell when to induce abortion? Is the profession in such odium that no physician dare perform what his science indicates, his conscience justifies, his duty demands, and his diploma legalizes? Such counsel is apt only for cowards, or criminal abortionists.

In the section on Injuries and Diseases of the Bones and Joints, there is a masterly article by Arbuthnot Lane, upon the Operative Treatment of Fractures.

Dr. Donald Armour repeats his Hunterian lecture upon Spinal Cord Tumors. He still writes that intramedullary tumors are beyond surgical treatment, although Elsberg of New York has successfully removed them. Yet Dr. Armour reports some progress; he states (p. 1223, Vol. II): "Chloroform anesthesia is induced by means of a Vernon Harcourt inhaler . . . ." Now that chloroform has been rendered superfluous the position of anesthetist to Dr. Armour becomes a sinecure.

But the sketchy nature of most of the surgical directions is probably unavoidable. To make this book a guide to surgical treatment some uniform plan should have been adopted, so that one group of contributors would not have provided us with an inadequate substitute for a treatise on operative surgery, while another group struggled to write a portion of a surgery text-book. The writings of the great teachers who, of their charity, have contributed to this system are too condensed materially to alter the standard of the work. Those who are acquainted with the unabridged versions will find that the synopses here offered have deprived the teaching of these masters of much of its force, individuality and suggestiveness. Those who are not yet acquainted with the writings of Mitchell Bruce, Eustace Smith, James McKenzie, Bonny or Arthur Keith would be better advised to buy the works of these authors than to acquire the few tid bits here afforded to them.

The proofs have been excellently read. In so many thousand pages of print, errors are remarkably few. In spite of the excellent articles, this system will not help the general practitioners, except perhaps to refresh their memories on many things already tried and forgotten. The directions given are, as a rule, too vague to be of any use in actual treatment. In the opinion of the reviewer, medical energy should not be spent in the reading of these four ponderous volumes.

William J. M. A. Maloney (New York).

The Nervous System. An Elementary Handbook of the Anatomy and Physiology of the Nervous System. By James Dunlop Lickley, M.D., Demonstrator of Anatomy, University of Durham College of Medicine. Longmans, Green, and Co., New York, London.

This is a small, convenient and reliable short account of the structural elements of the nervous system designed for students of psychology and neurology. Gray's and Quain's Anatomies have supplied most of the illustrations and much of the text. This latter has been well chosen and put into compact and easily get-at-able form. For its purposes the work is admirable.

Jelliffe.

Jahresbericht über die Leistungen ü Fortschritte auf dem Gebiete der Neurologie und Psychiatrie. Redigiert von Prof. L. Jacobsohn in Berlin, XV Jahrgang. Bericht über das Jahr 1911. S. Karger, Berlin.

We welcome once more the appearance of this valuable Jahresbericht.

The conscientious and thoroughgoing character of the work herein contained makes it invaluable for the worker not only in neurology and psychiatry but in all the borderland fields so rich in the affections of the nervous system.

No single work in neurology and psychiatry is as valuable as this. To the man in a large city with ample library facilities it is of particular value in leading him directly into the center of a problem upon which he may be actively working. To one without library facilities it is a vade mecum. It contains the literature of the world as no other publication does. Moreover to the man with a limited amount of German, the style is so direct that such an one will find that a comparatively short grind with the rudiments of the language will make this work available to him.

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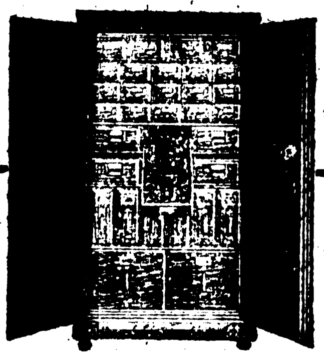

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Original Articles

PUNCTIFORM HEMORRHAGIC PIGMENTATION OF THE CEREBRAL PIA MATER[1]

By Edward Mercur Williams, M.D.

FORMERLY INSTRUCTOR IN NEUROLOGY AND NEUROPATHOLOGY AT THE UNIVERSITY OF PENNSYLVANIA AND ASSISTANT NEUROLOGIST TO THE UNIVERSITY HOSPITAL

In a careful search through the literature, including the well-known works of Mott, Nonne and Oppenheim, I have been unable to find any reference made to what is here described as punctiforme hemorrhagic pigmentation of the pia mater.

Ameuille reported numerous minute hemorrhages in the white substance of the subcortex and the occurrence of small hemorrhagic foci in the pons was described recently by Rimbaud. In a syphilitic case Spiller found hemorrhages in the medulla oblongata and cord in chronic poliomyelitis, and similar extravasations occurred in the acute case reported by Mills.

Large and diffuse subarachnoidal or pial effusions have been mentioned as occurring secondarily to infectious diseases, such as anthrax and scarlet fever, in so-called purpura of the nervous system (Ameuille and Lenoble) and following traumatism or rupture of an aneurysm of one of the basal arteries.

An interesting case of such extravasation involving the pia of a large part of the brain was reported by Leopold. These conditions of diffuse subarachnoidal effusions of blood are all most likely due to a toxic weakening of the blood-vessel walls with subsequent large effusions, but owing to their large size, distribution and distinctly hemorrhagic nature they cannot be confused with the minute areas of pigment such as are present in the specimen here discussed.

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[1] From the Department of Neurology and the Laboratory of Neuropathology in the University of Pennsylvania.

Obersteiner refers to pigment cells found normally in the pia over the base of the brain and particularly on the anterior surface of the medulla oblongata but pathological extracellular pigment is not mentioned.

The gross specimen of the brain in this condition showed numerous minute brownish pigmented areas of pin-point size.

A microscopical examination of these punctiforme areas showed them to be clumps of granular pigment. They were mostly independent of the blood vessels but the presence in several places of similar pigment granules, though in much less number, immediately around as well as within the vessel walls suggested the probability of their hematogenous origin. Such granules were also scattered in very small numbers throughout the cortical substance but always in close proximity to the vessels. The pigment is for the most part free in the tissue, though some can be found to be intracellular.

The presence at one point in the pia of what looks like an aneurysmal enlargement forming a thickened connective tissue nodule with free pigment and blood cells extending from it into the cortical tissue also shows the blood to be the most evident origin of these areas of pigment.

The luetic infection in this case with its consequent arterial thickening and weakening would doubtless predispose to such condition.

While the pigment would react neither to the test for melanin nor to the one for hemosiderin, it is possible that the material was either too old or the preservative used not a proper one for the obtaining of these reactions. The presence, however, of a faint blue reaction in some of the blood-vessel walls, showing the presence of albuminate of iron, would lend contradiction to such a possibility. The pigment may be in the stage mentioned in the work of Claude and Loyez, in which the ferrocyanide test is not active.

By a careful comparison of the sections with specimens of a melanotic sarcoma, stained by similar methods, there seemed to be a distinct difference between the two pigments.

With the hemalum-fuchsin stain the granules were yellower than the melanin and with artificial light in addition to their being yellower, they showed, by oblique illumination, a glistening metallic, reddish copper colored appearance totally unlike the muddy black color of the melanin. This metallic luster is present, though much less distinct, in sections stained by Weigert's and Nissl's methods, while the melanin sections do not show this high refractive power by any stain. Nissl's stain showed the granules to be dark brownish, those of melanin black. Weigert's gives black color while the color of the melanin pigment is a lighter brownish black.

The general appearance of the pia is that of a case of syphilis. The round cell infiltration is very marked and plasma cells are present in great number. The vessels are thickened and in some of them the adventitial coats are thickened and infiltrated, while in others the overgrowth is confined mainly to the intima.

I am indebted to Dr. Wm. G. Spiller for the privilege of reporting the following case.

G. W., white, age 58, laborer. Admitted to the Philadelphia Hospital February 13, 1907. Family history and patient's early history negative. Present illness began eight days before admission, at which time patient fell from weakness while working but remained conscious. Further history was not obtainable owing to unreliability. The patient denies the use of alcohol, although the first thing he asked for upon awakening in the morning was a "five-cent whiskey." The patient's wife stated that on December 24 the patient was about to go to bed when he suddenly became nauseated, dizzy, and weak in the legs, particularly in the right leg. He fell to the floor, hitting his face, vomited freely and the bowels were evacuated. He was put to bed and remained there one week. Then he got up and seemed well except that at times he was mentally confused. He walked around the house but never returned to work. January 15 he seemed quite bright, but about ten o'clock he had an attack very much like the above and vomiting lasted all night, and till about noon the following day. The patient since then had been mentally confused, though at times he talked rationally, answering questions. He would sleep during most of the day but was very restless during the night, throwing the covers off, etc., but never making much noise. The patient had also been confused at times during the last year.

Examination.—The right lower face seemed paretic—speech was slow and thickened, though the patient said that he had always lisped a little.

The pupils were large and equal and reacted promptly to light and accommodation. There was some ptosis and the left palpebral fissure was wider than the right.

Extraocular movements were normal except upward associated movement which was somewhat impaired.

Tongue deviated slightly to the right on protrusion, and showed some coarse tremor.

Upper extremities were normal in power and movement—no atrophy. Some ataxia, however, was seen in the finger to nose test.

Lower limbs were normal in size and strength, though there was some ataxia by heel to knee test. Knee jerks and Achilles' tendon reflexes exaggerated. A suggestion of ankle clonus was present on the right side. No Babinski on either side.

No vesical disturbance but occasional loss of control of bowel.

Patient's mind was not clear but confused and semi-stuporous. He had to be restrained in bed during the night. He presented the picture of senile confusion with alcoholism.

Dr. Spiller examined him and the notes are as follows:

Patient was decidedly stuporous but he could be partially aroused. Would not do anything he was commanded to do.

The right side of the face was not moved so much as the left during his mumbling. Pin prick on the right side caused him great discomfort and he raised his head and moved the left arm very feebly. The right arm was not moved at all. The biceps and triceps tendon reflexes were normal. He was not aphasic. The left lower limb was moved freely when stuck with a pin; the right only feebly and only at the hip. The patellar reflexes were slightly exaggerated—the Achilles' tendon reflexes were very prompt. The Babinski sign was not obtained on either side.

February 15, '07. The patient had become more stuporous and more restless when awake—struggling a great deal. His nose became reddened and swollen, this swelling extending to the left side of the face.

February 16, '07. Patient had been doing very well—temperature had fallen but in the morning suddenly became very high. Respiration became short, jerky and rapid. There was dullness over the right lung posteriorly, extending anteriorly to anterior axillary line. Numerous râles could be heard over this area. The general condition became gradually weaker in spite of all stimulation, and the patient died at 9 p. m.

For microscopical examination sections were made from the medulla oblongata, and from the cervical, thoracic and lumbar regions of the cord. Hemalum-fuchsin, Nissl's and Weigert's stains were used.

The examination of the cortex shows the pia thickened and intensely infiltrated with round cells and a large number of plasma cells. The vessels are sclerosed, thickened and congested. The ganglion cells are very weakly stained, numbers of them degenerated and the glia may be somewhat increased. Clumps of yellowish pigment as previously described are beneath the pia.

In the medulla oblongata the round cell infiltration of the meninges is very marked and the vessels are congested, some of them being so distended and their walls so indistinct that the appearance is that of an intrapial hemorrhage.

Streaks of yellow pigment of irregular sizes and shapes are around some of the blood vessels (hemalum-fuchsin stain)

The cells for the most part are very weakly stained and with a few exceptions, probably degenerated.

In the cervical region the meninges appear thickened, congested and infiltrated and considerable fibrinous thickening is present.

The vessel walls are thickened and many of them hyaline in appearance. Surrounding or close to them are stringy looking masses stained bluish by the Weigert method. The fibers of the anterior and posterior roots are beaded and to a great degree degenerated. In the cord medulla the neuroglia is slightly increased and some of the vessels are congested, but there does not appear to be any degeneration of fibers or tracts of fibers. The ganglion cells are irregularly affected, in some instances staining very poorly, and in many the nuclei are partially disintegrated or entirely gone.

Amyloid bodies are very numerous and show a tendency to linear arrangement along the septæ or the vessels and are particularly thick along the posterior septum. The central canal is large and patulous and the ependymal wall is broken down.

In the sections from the thoracic region the changes are almost the same as in the foregoing. Some of the pial vessels have their walls so disintegrated that the different coats can not be distinguished from the surrounding infiltrated tissue and cells. With the exception of a few fibers to the cells of Clarke's columns none can be found at the entering root zones. The cells of Clarke's columns are degenerated, very few of them having any nuclei and these only indistinct and poorly staining ones. The anterior horn cells are not so numerous as in the normal and some of them are degenerated. In those apparently normal there is an unusual prominence of the protoplasm granules by the acid fuchsin stain.

The central canal is obliterated and the group of ependymal cells seems abnormally large.

In the lumbar segments the findings are about the same with the exception of the presence of a more intense congestion of the capillaries of the gray substance of the cord and a more definite and pronounced overgrowth of the intima in the blood vessels of the pia.

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THE PRESENT KNOWLEDGE OF THE STATUS OF APRAXIA WITH THE STUDY OF A CASE

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(*Continued from p. 169*)

E. S. Male, white, married. Veteran of Civil War; an inmate of one of the Soldiers' Homes; was transferred to the Government Hospital for the Insane, May 23, 1911, at the age of seventy-two years. Very little is known concerning his previous history and letters from his wife and several children portray their ignorance and almost illiteracy. The wife alleges he did not suffer from the usual diseases of childhood. Attended school until fourteen. Served throughout the War and later became a station engineer and steamfitter. It is known that he was right-handed. However, the patient states that although he could not write with his left, he was so skillful in the use of this hand that he was called "Old Ambidexter." By reason of rheumatism and inguinal hernia he entered a National Home for Disabled Volunteer Soldiers at the age of sixty years. Four years later a paralytic seizure occurred, affecting "his speech as well as his entire body and for several days later he was unable to speak well." It could not be ascertained whether one side of the body was affected more than the other, but it was stated that he was not rendered unconscious by the attack, which lasted only several days and was not followed by lameness. Since this illness, his wife asserts, he has been "absent-minded" and he never recovered from the speech disturbance. Prior to the seizure in 1904 it was learned that he wrote a clear hand, and several pages from a memorandum book containing scraps of writing from year to year corroborate this. Regarding his ability to write since the attack, it has been learned that as late as December 6, 1906, he signed his pension voucher legibly but tremulously. We have no record of handwriting after March 25, 1907, when he attempted to sign the voucher but failed and his mark had to be substituted. It is not known whether on these two occasions he wrote with his right or left hand. Habits are recorded as excellent and he has never been addicted to excessive indulgence in alcohol. Venereal disease is also denied.

The trouble which resulted in his transfer from the home to this hospital first became manifest in August, 1910, when he was "senile, childish, wandering about aimlessly and becoming lost." He finally became unmanageable because of his wandering propensities and was transferred here accordingly. During the patient's first year in the hospital he was generally disoriented in all spheres, although occasionally knew the name of the institution, his physician and several nurses. Memory poor for both recent and past events and frequently forgot in the morning what transpired in the previous night. At times during the day, and especially at night, he would be confused for several hours, screaming and calling for one of his children. In these attacks at night he would quarrel with the night nurse, whom he mistook frequently for a man from Chicago. He would upset his bed and then pile his bedclothes in a corner of the room and kick and bang on the door. Generally in the daytime he was most agreeable, jolly and quick-witted. He was, however, not disposed to have much to say unless questioned and never conversed with his fellow-patients. He was very fond of the women nurses and at times in the evenings after his favorite nurse left the ward, he would weep inconsolably for a long time, declaring she was gone, never to come back.

The aphasic disturbances described below were evident on arrival and have not changed essentially. The patient's gait, at first rather slow with short steps and feet wide apart, remains about the same to-day. The opacities from double cataracts, impairing vision markedly, have increased somewhat since entrance. Otherwise his condition has not exhibited any marked changes during his residence here. The patient possesses full insight regarding his poor memory, disorders of speech and inability to perform certain tasks required of him. As a rule he laughs over these deficiencies but at times is quite provoked with himself. No delusions or hallucinations have been elicited since entrance here.

On July 1, 1912, the patient first came under my care, having been kindly transferred to my department by Dr. Dynan, who had previously made interesting and valuable observations on him.

July 30, 1912: Physical examination: A large, well-built man. Hair white and abundant. Height 5 ft. 10 in. Weight 230 lbs. Skull well shaped; shoulders stooped. Large mole just below left eye, probably epithelioma. Large left inguinal hernia. Respiratory system normal. Cardio-vascular system: Rhythm slightly irregular; rate 72 per minute sitting position. Some roughening of aortic second sound. Radial sclerosis, as well as temporal, well marked. Varicose veins of lower extremities. Urinalysis: Reaction acid; specific gravity 1020; albumin and hyaline casts. Wassermann reaction with the blood serum negative. Untidy in habits frequently at night.

Eye examination: Cornea shows arcus senilis. Irides blue. Pupils are unequal, contracted, the left smaller than the right but responds fairly actively. The response to light is sluggish in right pupil, the extent is little. The right is irregular—an arteriosclerotic pupil. There are no ocular palsies, although at times upon command the patient is unable to move the eyeballs to the right or the left or raise or lower them. Color sense present but is impaired on account of cataracts. Lens somewhat cloudy in left and right. Vision toward right field of right eye is poorer than toward left field of left eye. Can read letters but at times can only pronounce with difficulty. Can tell the time from an alarm clock. Reads letters three inches high at a distance of 15 ft. Distant vision better than near. Cannot count fingers at 2 ft. with right or left eye. Vision approximately 2/20 both eyes. Examination of retina impossible on account of opacities of the lens. Hearing: Has to be told several times for one thing; is unable to hear forced whispers. Hearing appears equally impaired on both sides. Smell: Equally impaired on both sides; recognized, however, turpentine in both nostrils, oil of cloves; cinnamon approximately with left, no recognition with right; recognizes camphor and peppermint with right but not with left; asafoetida—bad smell with both; tobacco recognized with both. Taste: Salt, says salty; quinine, bitter; also recognized Epsom salts; fails to recognize sugar solution.

Motility: No muscular pareses have been observed. Rarely fails to protrude tongue on command, protruded straight with coarse tremor. Opens mouth wide upon request. Frequently cannot move lips or lower jaw from side to side. Cannot purse lips for whistling. Puffs out his cheeks fairly well upon request. Cannot nod head. "When you ask a man a question and he nods his head, what does he mean?" "He means 'That's all right.'" "Shake your head?" Unable to do it. "When you ask a man a question and he shakes his head, what does he mean?" "Means he can't tell me." Patient unable to frown or raise eyebrows upon command, yet at other times these movements have been observed. "What does a man mean when he frowns?" "Why it may mean a good many things—something he can't unravel or he's mad." The right forearm and hand are generally held flexed, the elbow pressed to the side. Makes very little voluntary use of this member unless he is weeping, when he wipes the tears away. At times is also seen scratching corner of right eye and his nose with the right hand. There is a slight hypertension of right forearm and shoulder joint. Always grasps objects with the left hand, although at times he assists the latter with the right, when he handles any object to indicate its use. Grip varies in the two hands, but it might be safely said that it is frequently equal and good in both. It has been noted to be rather powerful in the right hand. The grip is invariably good on the left side. There is only a very slight tremor of extended fingers and no gross jerking tremors during manipulations with the hands. There is no difference in the measurement of the two arms. Although at times he cannot raise right arm, make a fist on this side, flex or extend wrist, flex elbow or abduct or adduct it, he has been known to perform these commands by imitation after passive movements made upon his own person and at times by imitation alone. On the left side all of these movements are as a rule made with fair correctness. The poor results in imitating movements are occasioned partly by his deficient vision. The patient walks with very short, hesitating steps, his feet rather wide apart and lifted slightly from the ground. He can kick with both feet and when lying down can flex both thighs upon abdomen, legs upon thighs, flex and extend ankles and flex toes. It is not believed that there is any real ataxia. Those movements which he does make show no shakings or tremors, only a certain amount of retardation. He is able to carry out commands as well with the eyes closed as open. If told to touch his nose or ear or bring his hands together interlocking fingers, if he succeeds at all he does not miss the parts required to be touched but, as is more frequently the case, he cannot approach the desired spot.

Bodily sensibility: Tactile sensation to light touches of camel's hair brush greatly lowered and almost absent in upper and lower extremities on right side; greatly diminished on left side but not so pronounced as on right. Sensation appears to diminish towards the distal parts. Light touches not felt on tips of fingers of right hand but he appreciates touches near tips on palmar surface of left hand. Over right biceps felt "something like raw cotton." When plantar surface of right foot was tickled with camel's hair brush, he said he felt nothing, although there was a slight defense reaction and toes flexed somewhat. Easily felt brush on chest and abdomen on both sides; practically absent over entire back. For heavier touches his results were good over entire body. Says, "Now, you're doing something" when examiner presses with tip of finger. Easily felt toothpick scratches over body. Pain sense normal to pin pricks. Heat and cold sense normal over entire body; was practically unable to localize over entire body. Would say, "I know you touched me but I couldn't tell you where. I don't know whether it was on my arm or my leg." The following exceptions are to be noted: At one time when the calf of right leg was being stroked with brush just after sole of foot on the same side had been tickled when he said he felt nothing, he remarked "I feel something there." "Where is it?" "It feels like you tickled the bottom of my foot." When the left groin was stroked and asked to locate just after blindfold was removed, he promptly scratched with left hand the area stroked. On numerous other occasions he was allowed to look just after the touch ceased and he invariably failed to locate the right spot, explaining that he just couldn't tell. With heavier touches or pin pricks his results were very little better as regards localization, but when right ankle was pricked, promptly said, "My ankle." Frequently during the examination attempted to locate by remarking, "You are touching right there" accompanied by an effort at pointing with left hand, which assumed the correct pointing position, the index finger merely pointing directly above him. Generally he made it quite clear that he had no idea where he was touched. Passive motions of fingers he appreciated, also wrists and elbow joints on both sides; also flexed thigh and flexion and extension of ankle. There is no difference on the two sides of the body. However, he could not state just what was done with the limbs. On one examination six days previously, his results at localizing were much better, and when the examiner crossed left ankle over right and patient was asked what was done, he answered, "You changed my legs one to the other." Again when examiner placed left heel just external to and above right knee, he said, "You placed my limb right, right inside my knee" and pointed correctly with left hand on knee just where the left heel touched. Again in the same examination six days ago examiner placed right heel just external to and above left knee. "What was done?" "You placed my heel above my knee." Still again his left knee was touched and he correctly said "My knee" touching it at the same time with left hand. Was correct again in the same manner after right knee was touched. Thus is evident his rare examples of locating correctly. Patient can stand with closed eyes without swaying, also able to walk blindfolded..

Tactile agnosia (astereognosis): Blindfolded: *Bottle:* Left hand. "I can't tell anything about it; I can't recognize it." How's it feel? "Smooth. There's a kind of sharp edge." (Feeling along edge of bottom of bottle.) Says it's of medium weight and feels cold. Right hand: Same reaction. Fingers it carefully. Says it has a flat surface on it. (Correct.) Medium weight. In fingering small neck and the cork said it was rough there and felt cold. With both hands: Was still unable to identify it. Eyes open: Promptly: Bottle. *Tooth Brush:* Left: "That is a key, but don't misunderstand me to say whis-key. No, that ain't a key." Now, feeling at the tip end, which is rather sharp, he says, "I feel a cutting edge." Says it's light in weight. Right: No effort to grasp it. Fingers have to be clasped about it for him. When he feels the bristles, says, "Something with edge to it. It's light in weight." Both hands: No better result. "I can't find out what it is." Blind removed: "Tooth brush; well, well." *Billiard Ball:* Left: "Round . . . smooth . . . , comparatively heavy . . . , can't tell what it is." Right: "It's the same thing." He gives the same remarks as regards its characteristics. Eyes open: "Ball." *Pipe:* Left: "I can't tell. . . . Medium weight. . . . I feel sharp edges" (correct). "Smooth." (Over bowl.) Right: "I can't describe it." Eyes open: "Pipe." *Pocket Knife:* Left: When feeling blade, remarks, "Something on that feels like a watch." Right: "I can't tell what it is." Doesn't even discover sharp edge. Eyes open: "Knife." *Comb:* Left: Running thumb nail over teeth, remarks, "That's a screw of some kind or other. It has the appearance of a small screw. Has edges about it." Right: "I can't tell." Is it flat or round? "It has edges." Does it feel like a screw? "There is something about it that has the appearance of a watch too, but I can't find out what it is." With both hands? No better result. Eyes open: "Comb." *Key:* Left: "Has the appearance of a key," after much fingering when he was about to give up. Right hand: *A different shaped and larger key:* Says, "I can't tell." The original is put in his hand. "Why, that's the key, too." *Watch:* Right: "By George, I think this is a key too. No, it isn't." Left: "That I can't tell." Is it round or flat? "I don't know." Eyes open: "Oh, it's a watch." *Teaspoon:* No recognition in right, but when transferred to left after much fingering, said, "Teaspoon." The handkerchief which had been used as a blindfold, lying in front of him, he was told to put in pocket. He did so with left hand promptly. *Tennis Ball:* Left: "That's something like a pen. It's not like a bottle or anything like that." Is asked, "Is it hard?" "Yes (then pressing upon it with fingers) but it's inclined to be soft too." Does not finger the ball with right. *Small Wooden Ball:* Left: "Has the appearance of an acorn." Right: "I can't tell." Does not attempt to describe its properties. *Small Iron Ball:* Says it's heavy when placed in each hand but cannot recognize it or give any of its properties. *Wooden Cube: Ovoid and Hexagon:* Fails to recognize these in either hand or to note their characteristics. With opened eyes he called the cube a wooden block; the ovoid a wooden egg; the hexagon a piece of wood. *Medicine Glass:* With left says it's a bottle; with right hand "I can't tell." Open eyes: "A little glass." The patient blindfolded distinguished correctly the respective weights of the tennis ball, wooden ball and iron ball.

Reflexes: Left knee jerk exaggerated markedly; right slightly exaggerated. Tendo-Achillis, triceps, ulnar and radial normal.

SPEECH—July 3, 1912. Reaction to words heard: From observations it has been ascertained that understanding of speech is unimpaired. He can always describe in speech what is required of him if orders are given, although he is incapable of executing the proper purposeful movements to accomplish many acts. He is able to compose many words spelled to him, as m-o-u-s-e, h-o-r-s-e, his own name, etc.; he can compose words better than he can spell, as his stammering annoys him and he frequently gives up for this reason. Spells correctly, green, brown, porch, Danville, Illinois, Sanders, but claims that he is unable to spell many words apparently just as easy. His attention, it may be said, is always good. He rarely repeats the question asked unless it is apparent that he has not heard correctly. There is much stammering and frequent word perseveration; never any irrelevant productions, and if paraphasic utterances occur, he always appreciates the mistake and corrects himself without assistance.

Selecting objects named: Groups of four articles were placed before him and he was able to select the one called for (pipe, watch, spoon, hammer, ink bottle, tooth brush, pen knife, scissors). At times he was required to identify the one desired when more than four were before him, and at the conclusion of the task, when scissors were called out, all eight articles were before him. It required some moments for him to discover the scissors, carefully passing his fingers over all, before locating the desired one. In several instances it was necessary for him to employ the sense of touch to aid in identification, and without touching the others he picked up the article named.

He was asked: Can birds fly? Yes. Can pigeons fly? Yes. Can a horse fly? No, he switches his tail. Can a chicken give milk? Well, hardly. Can a dog lay eggs? No, indeed. Can a cow give milk? No, I don't think they do. What did I say? You asked me if a cow could give milk. From what animal do you get milk? The cow. You just said a minute ago that a cow could not give milk? Oh, did I? I didn't mean that. What animal lays eggs? Hen. What animal barks? Dog. What animal brays? A jass ax (laughs). Can a cow give milk? Yes, indeed. Can you name any others? A goat does. Why does a man eat? In order to refresh himself. Why does a man drink? I never drank in my life,—it's a fashion. If it was not for drink many a man would be sober yet. Can a man get drunk on milk? No. On soda water? I don't think he could.

He recognized instantly, with decided wit reaction, vocal imitations of animals,—cat, dog, duck, rooster, mule, partridge, horse; he could not, however, imitate any of these himself,—explaining "I can't commence it." Rooster crowing, for instance, —"Oh, I know it crows, but I can't crow."

Correctly and promptly adds 5 and 3, 10 and 4, 7 and 8; subtracts 7 from 15, multiplies 12 by 12, 11 by 11, 9 by 8; doesn't know how much 7 times 9 is. When asked what number comes between 8 and 10, after a pause says 9; does not know what comes between 16 and 18. Is told to say partridge, says it's a bird, adding "bob white." Sparrow—"a bird" (no linguistic conceptual disorder).

Repetition of words and sentences: Repeated a number of sentences after examiner without stumbling. The test sentence, "As I was going down to the Methodist Episcopal Church, I met the 33d riding artillery brigade," was at first given him as far as church, and he repeated it, stumbling on Methodist and Episcopal. Then the remainder was given,—the latter repeated with much greater ease. On the fourth trial he was able to remember the whole sentence, and on this occasion he spoke with little stumbling. Stumbled badly on hippopotamus but did quite well on Theophilus Thistle.

Spontaneous speech: There is no transposition of nouns; perseveration is common. Patient's vocabulary is fairly extensive. He is quite contradictory in his statements as regards his past and his history, for this reason, is totally unreliable. He opens a conversation well, but is not apt to volunteer much during an examination and never interrupts the examiner. He was asked, "When were you born?" "I was born in 1834, at Allenville, Ind-ind-iana, and I'm about, about thirty-four years old (perseveration from 1834). No, no, that ain't right, of course, I don't know just how old I am." "How many times have you been married?" "Twice" (correct). "What did your first wife die of?" "'Deed I don't know, it has been so long ago, and she was one grand woman; there was nobody like her," etc.

In giving alphabet, on first trial was correct as far as P, stumbled and began over again without suggestion. Was correct this time as far as U, then said "Du, q, x, z—no, that ain't right." Started over,—this time correct as far as T, following with w, x,—"that's wrong, I know,"—slowly,—"u, v, w, x, y, z." In counting from 1 to 50 he went as far as 30 faultlessly, paused, seemed in doubt, but his attention was still good, then finished correctly without prompting. He makes quite few mistakes in counting backwards, and complains that such a test confuses him.

The Lord's Prayer is given as follows: "Our Father in Heaven, Hallowed be Thy —— Give us this day our daily bread, —I used to know all of that but I can't bring it to mind—our daily bread—Forgive—I can't get it exactly"—(sighs).

Gives days of week and months of year correctly forward; cannot repeat months backwards, but can repeat days of week backwards.

Recognizes fiddling, shooting, sparring: Engineer's signal meaning "back up." Beckoning "come here." Blowing a cornet. (For further examples, see apraxia, below, movements *conditioned by visual stimuli.*) Cannot recognize figures drawn on palm of hand. Cannot distinguish between circle and square on either hand. Recognizes a straight mark, however, on left but not on right.

Reaction to words seen (reading): Read most of letters of alphabet 3 inches high. Was confused in distinguishing G from C which resemble one another; mistook P for an R. Read following words ¼ inch: Ezra Sanders, fowl, sheep, bear,—a sentence beginning, "there are many kinds," also, "for Christmas turkey." Understood what he was reading. Could conjoin letters into short words, as dog, cat, rat and mouse;—if lengthier ones were tried, said he could not see. Read correctly and knew the meaning of Y. M. C. A., G. A. R., U. S., N. Y., and C. S. A., —laughed about the latter, adding that it also meant Confederate Rebels of America. Recognized the following numerals 3 inches high, 1, 2, 3, 4, 5, 9, 10, 13, 14, 15, 18,—then complained of his eyes hurting him. Mistook 6 for 9, 7 for 4, 8 for 6. Failed to recognize 11, 12, 16, 19, 20, 21, 22. When studying over 11, said there were two ones, but could not identify the two together,—made the same error with 22, both of the components of which he recognized. The patient was unable to read script—with one or two exceptions (recognized "Ezra," first name). Remarked in connection with this "if the letters were wide I could see them better," meaning if the strokes forming the letters were wide he would succeed. He failed to recognize a 5 pointed star sketched by the examiner, or a square or a triangle; recognized a circle, however, "that's something round." He was unable to recognize letters upside down.

Writing: There is complete bilateral agraphia or rather apractic agraphia. Is unable to spontaneously write a letter, form a figure, or sketch the simplest form; neither can he copy the same or write at all from dictation. Says at one time he could write a good hand, and he don't know why he can't now, because "I'm not paralyzed." He has great difficulty in grasping the pencil with the right hand, the fingers failing to close about it. Generally picks it up and holds it as one would a table knife. Frequently it is necessary for one to clasp his fingers about the pencil before grasping it. He is able to hold the instrument of writing in a much more natural position with the left hand, and requires no assistance for the initial clasping as in the right. His efforts at writing result in mere scrawls, which bear no resemblance to what he tries to produce. He fully appreciates that he cannot do so at all.

Movements Conditioned by Visual Stimuli.—July 18, 1912. The patient continues frequently noisy at night, begging to go home and cursing quite vehemently any one who approaches him. For brief periods during the day he paces about restlessly, demanding his release. On these occasions, quite contrary to his usual behavior, his language is vulgar and obscene toward the women nurses. This afternoon he is quite cheerful and contented. The right arm is flexed, the elbow at the side. He was asked if the arm was paralyzed and replied, "No, it ain't paralyzed and I don't know what's the matter with it." He did not exhibit any restlessness whatever during the interview, was quite patient, and attention good. He cooperated willingly during the lengthy examination and showed no signs of tiring at the end, retaining his good humor throughout. Self-depreciation, however, quite characteristic of him, was quite evident, and at the beginning of many tasks he remarked that he would try to do everything asked of him, but he didn't think he could do it. Said, "The doctor that attends me (referring to former physician, whom he had not forgotten at this time) took a lot of trouble to learn me these things. Lots of them I get and lots of them I can't." Objects held before him for inspection he always grasped with the left hand and appeared to avoid all use of the right. Occasionally when an object was handed him in his left hand the fingers failed to close about it and the article would fall into his lap. His grasp at times on this side was awkward and he would turn the article over several times before the fingers would assume the correct position of holding it. When he took objects in his right hand he almost invariably failed to grasp them at all at first and the examiner was compelled to close his fingers or otherwise it would drop. He appreciated this difficulty and once remarked, "I have trouble getting hold of things." The patient often failed to lay aside an object when he was through with it, and on one occasion when another was about to be handed him, the one in question had to be taken from him, although he easily enough relinquished his grasp upon it. A series of colored pictures of animals were held before him. (The sign + indicates that his answer or response was correct; — indicating incorrect.) Goat — says he cannot describe it. Looks it over carefully and says "Sheep, ain't it? I can see its eyes and its horns." Rooster — there is a rooster there. Pig — Big shape of some kind. Being a rooster it looks familiar. Is it a rooster? Looks at it again intently. Is it a cow, duck, pig? I can't find out. Horse — after a pause says "looks like a horse of some kind." Now a hammer was held before him. "That's a handy concern — a riveting hammer." Pipe — "A familiar article — a pipe." Tooth-brush — "Mighty good machine — tooth brush." Door key +. Scissors + "A pair of shears." Yale lock and key. These he insisted upon handling, explaining that he could not see well. He took the objects in his left hand and a moment later examined them with both. He turned them over, fingered them and twisted them about. "I can't find out." He holds out a key attached by a string to the key which was in the lock. "I believe it's a key of some kind." Another larger Yale lock +. Clock +. Comb +. Wrench — A saw set. My father used to run a saw mill. I ought to know all about them. You've got me, I don't know what it is. Button-hook — "a button heave — button hook to lace shoes with." Screw driver +. File — a three square file. Tape line — In this test the visual stimuli could not alone be used and he insisted upon handling it. He looked it over, grasped it with his left hand and then used both. He twisted it and turned it about, grasping the winder first with one hand, then the other; the fingers of his left hand accidentally got hold of the ring at the end of the tape and yet he did not pull it out. The tape accidentally became unwound for several inches and still he did not unwind it. After twisting and turning it about from one hand to the other, gave it up. Clothes brush +.

Imitation of movements performed in front of him was not successful, as it was found, owing to his defective vision, he could not see well enough many movements, especially finer and delicate motions made by the examiner, so *imitating passive movements* were required. Left hand: Examiner doubled up patient's fist and he was told to do it alone. "I would like to but I can't do it." The right hand at the same time promptly does so; tries to grasp his left hand with his right, but is restrained. With the right hand he makes a fist after passive movements were made for him. Now he is required to do the same thing with both hands at the same time. Both fists are closed by the examiner and as soon as they are opened voluntarily he is told: Do what I did for you. He does so promptly.

Pronation and supination of left hand (adiadokokinesis): There is a slight lateral motion of the left hand, also of the right at the same time, after required movements were made for him. With the right hand alone he is unable to do the task. He alternately opens and closes his fist. What did I want you to do? "I'm supposed to turn my hand over and over." Both hands: The movements are made for him. Now, what do I want you to do? "You want me to turn my hands over and over." He promptly brings them together, then raises each to side of head, rubbing his scalp. He is again asked what is required. Answers correctly. Is asked if he did it. Says "No, I don't believe I did." Rapid pronation and supination are now made for him, and he again brings hands to head. This time he again understood what was wanted, adding that he should have done it at first.

Flexion and extension of wrist: *Left:* Upon the examiner releasing his hold of patient's wrist, he cannot make required movements. Hand trembles somewhat. Tries to grasp left wrist with right hand but is restrained (a few moments later while the examiner was writing, the patient was seen with left wrist resting carelessly on arm of chair, drumming fingers with ease, his four fingers, from little finger to index.) *Right:* Says he can't do it —instead he opens and closes fist. The movements are made over again for him, and he still cannot flex or extend wrist, but merely grasps the hand with the left. Now same movements are made with both hands. He says "If I could just get those things started all right, I know I could do it." Still holds his hands out, then there is merely a suggestion of flexion and extension of the left hand, but none in right.

Separate fingers, thumb up: *Left Hand:* As in previous tests passive movements are made for him. "I can't do it." What did I show you to do? "It's perfectly easy. I can't do it. You said to sep-sep-arate my fingers th-th-thumb up." Does nothing; gives up the trial. *Right:* Wants to help out with his left hand. "'Deed I can't do it; my fists would just close up." He remembers what is required of him. He pauses, gazes intently, but fingers flex and fist closes tightly.

Point index finger: Left: After waving arm about in the air, there is more noticeable extension of index finger than of the others, which are not flexed, as he had been directed to do. There is no suggestion of pointing with right hand, the separated fingers of which waved about in the air. Passive motions of pointing both index fingers were made for him and after apparently aimless motions of both arms for quite a few moments, there is a tendency towards the required result in the left hand (which acted quite as well previously in the same task alone) but the right arm still waved aimlessly about, with no flexion of any of the fingers,—he then gradually flexes the right elbow and catches hold of a button on his coat. Afterwards remembers exactly what had been required of him.

Turning fists over one another: After his arms were guided properly and examiner released hold, he invariably in three or four trials was unable to proceed alone. The fists opened each time and he carried the hands to his head. Said, "That beats anything I ever saw that I can't do that."

It will be seen from the above that the tasks were performed better, approaching much nearer the desired result, with the left hand, yet in the same tests with both hands they did not work more correctly in conjunction, the left hand apparently being of little use in aiding the more affected right. On several occasions while one hand was trying to perform a task, the other after attempting to get loose, with the evident purpose of helping out, was relinquished by the examiner,—it failed to be of any assistance, however, and merely grasped the performing hand. Perseverations of speech as well as of motions were noted quite frequently.

Movements Conditioned by Auditory Stimuli: Upper extremities including reflexive movements: Make a fist: Examiner restrains the right wrist and patient is directed to carry out the command with the left. Both hands promptly close tightly. The left is restrained and with the right there is, at first, no result,—the opened hand waving in the air. It then closes tightly. Asked to open it, is unable to do so for a moment, and remarks, "I can't open it." Raise both hands high. Promptly and correctly. Left arm is held down and he is directed to allow the right to do this. The arm does not rise, says, "I can't get it up." Several moments later it goes to the side of his head, which he rubs with it. Said afterwards he was supposed to raise his arm up high. With the left alone he is able to perform this movement correctly.

Hold your arms out in front and turn your hands over and over: Opens and closes fists, at the same time widely separating arms. Separate your fingers widely. Performs this correctly with left. With the right hand merely opens and closes fist. With both hands together performs the act correctly. Point (left hand). "I don't know how to commence it." There is merely a wriggling of fingers, the arm extended in front of him. Put that index finger out. "That's what I can't do." There is hardly a suggestion of the desired result, and the examiner passes on to the next test.

Separate your arms widely and bring your hands together: Carries out the first portion of the order correctly, but as hands approach each other, he brings them to his head, which he vigorously rubs. "Did you do it?" "No, I keep getting it mixed up with something else." Examiner separates his own arms, bringing hands together quickly and interlocking fingers. Patient is told to imitate. He again carries out the first part of the order correctly,—palms do not miss each other as they come together,—there is a slight pause during which begins a movement of the fingers as if they were about to interlock, but instead he "runs off the track," makes violent washing movements of hands, then carries them to his head and exclaims, "There they go to my head again." "That's just the trouble, I can't keep them away from my head." Is told to snap fingers of left hand. Merely opens and closes hand. By imitation after several trials he is able to make the correct movements but fingers do not snap. With the right hand there is only an opening and closing of fist after command and by imitation, nor can he strike each finger of the left hand against thumb by command or from imitation. Opens and closes fist instead. The result is the same with the right and with both hands together. This test was tried several days ago. He could not do it at all with left hand upon command. After passive motions were made for him, he did it clumsily, then finally fairly well. With the right he could not perform the task at all.

Lock your fingers together: The result fairly good and prompt. He does this three or four times in succession. Blindfolded, the results are practically as good as with the aid of vision. Here there could be definitely excluded ataxia. Noting a frequent false motion of bringing his hands to his head in tests, he is to-day commanded to place his hands there; he does so promptly and correctly.

Put left hand on the back of the neck: (Examiner restrains the right.) Correct. Put your right hand on the back of your neck? "I can't, I don't know how to do it." Well, put your left hand on the back of your neck? "Now, I can't do it, I don't know how to do it now." Now put your left hand in the middle of your back? "I don't know whether I can do it or not." He puts his left hand promptly at the back of his neck and reaches down as far as he is physically able. The examiner then shows him how to touch the middle of the back by placing the arm under the axilla. The arm is directed for him. He then upon request performs this command quite correctly. The arm is now brought forward and he is told to do it over again. He cannot do it, the hand merely waving off from the side of his body. It was impossible to do this with the right arm even after passive motions are made for him. Now, put your finger on your nose? He puts both hands on the back of his head, his fingers pointing upwards as if he were imitating the presence of horns on his head. Are you touching your nose now? "No, but I'm aiming at it."

July 23, 1912: Upper extremity and reflexive movements continued: Yesterday in apraxia tests he was told to put finger on nose. He promptly and correctly did so with left. Now touch your eyes? Promptly and correctly. Put finger on mouth? Hesitated. What are you supposed to do? Put my finger on what I eat with. He clasped his hands in front of him. Where is your mouth? This was asked when he made another mistake by touching the palm of the right hand held in front of him with fingers of the left. "Why, it's between my teeth." Touch my mouth? "I'm afraid I'd dirty my fingers. No, I don't mean that. My finger is dirty." Well, do it any way. He touched examiner's mouth, groping somewhat in doing it. Now touch your mouth? He raised hand and promptly touched the center of his forehead. This morning a patient gave him a palm leaf fan. A little later he was seen by the nurse fanning himself with the left hand with ease. When the examiner came on the ward the fan was idle in his lap. He was told to fan himself. He fanned the air in front of him as if he were trying to ward off something disagreeable approaching him.

July 24, 1912: This morning the patient was quite disturbed, crying to go home, and cursing the nurses and doctor for detaining him. The absence of dysarthria was quite noticeable. He wept profusely, blew his nose with his right hand. When a handkerchief was afterwards handed him in his left hand, he wiped his eyes with it, then his nose. On entering the examining room later he was quite cheerful and denied the quarrel with the physician. He was told to wipe his nose (handkerchief in pocket). With left fumbles around lapel of coat, pulls at suspenders on the right side and starts to unbuckle them. Remarks, "I can't find my pocket." Then his left hand is placed upon it and with a great deal of pulling, he extracted a handkerchief from pocket, wiped his nose quite correctly upon request, also his mouth and then his eyes. Afterwards with no concern whatever, or hesitation, returned it with ease to his pocket. When the handkerchief was placed later in his right hand, said, "I can't do anything with it." He could not bring hand to face. He then removed the handkerchief from the right hand with the left and only after missing the pocket once, put it away correctly. A moment later, with apparent ease, ran index finger of right hand across the end of his nose and then wiped the corner of his right eye. This afternoon he uses the right hand spontaneously quite frequently about his face. Although he performs these movements with unconcern and ease, he does not use the handkerchief in right hand as a mop but employs the left frequently for this purpose.

Apraxic tests of the face, throat and trunk muscles:

Cough? Complied promptly and correctly.

Swallow? + (The sign + indicating correct.)

Spit? "I can't spit without chewing tobacco,"—merely ducks his head over the side of his chair.

Sniff, as you would a flower? No result.

Take a deep breath? +

Put out your tongue? + Move it from side to side? +

Raise your eyebrows? No result. Work your mouth from side to side? "I can't do it."

Whistle? "I can't do it." Smile? "I can't." No stretching of lips, which when not directed to do so break into a smile so frequently. Blow out candle? + Puff out cheeks? Fairly well done. Nod your head? No result. Shake your head? No result.

Nod your head? Brings both hands up and down from lap to head several times.

Shake your head? "I can't do it." No movement. Frown? "I can't do it."

Sigh? Fairly well done.

Close your eyes? Perseverates by sighing. What did I tell you to do? To close my eyes. Eyes remain open. Open your mouth widely? Correct and sighs at the same time. I didn't tell you to sigh,—what did I tell you to do? "To open my mouth widely."

Frown? "I will if I can,"—no result. Close your eyes tightly? Puts both hands on top of head. Command is repeated and still no result, but remembers command. Where are your eyes? He makes indefinite movements towards his face, reaches eyes and rubs them. His hands then fall into his lap. Now put your finger on your eyes? Puts up left promptly and tries to pull down the lid on this side with his fingers. Now close your eyes? "Ain't they closed," he asked, "No, well, ain't that funny," he replied. Is generally unable to move eyeballs from side to side or to raise or lower them. Stares at examiner when these commands are given and afterwards remembers what is required of him.

Patient is unable generally to bend the trunk either to the left or right, but has been known when standing upright to lean backwards as well as to flex trunk.

Movements conditioned by auditory stimuli: Lower extremity tests: Patient lies recumbent: Raise right leg high. + Lower it. + (quickly). Raise left leg, which examiner touches as the patient at times forgets which is his right and his left leg. Instead of raising left he raises right. Again command was given. Still perseverates by raising right. Again perseverates twice when same command is given. Says he knows he does it wrong. Examiner flexes left knee, placing foot flat on bed. Patient is told to imitate with right. Raises right leg high, the knee is not flexed. While leg is extended in air he is told to bend the knee. Instead of this he lowers the entire limb extended until it touches the bed. What did I tell you to do? You told me to bend my knee. Examiner crosses left ankle over right. Patient is asked what was done. You changed my legs one to the other. Now do the opposite of what I told you? Removes left from right, raises right high up in air and crosses left a little below the knee. Examiner now places left heel just external to and above right knee. Now what did I do? You placed my limb right, right inside my knee; points, however, correctly with left hand on his knee where the opposite heel touched. Now you do the same thing by yourself. He raises left leg and thigh. Shortly afterwards raised the right in same manner, then after both thighs are markedly flexed on the abdomen he turns over in bed on his right side.

Next the examiner places the right heel just outside and above left knee. Patient is asked what was done. You put my heel above my knee. Limb is now lowered for him and he is told to do it by himself. He was then asked what he was required to do and he replied correctly. As his result he simply raised his left thigh and lowered the leg over right shin. The right limb does not move at all. Now raise both legs. Promptly +. Examiner touches left knee. Where did I touch you? On my knee. Points correctly with left hand. The right knee is now touched. Points correctly with left hand. Examiner touches left big toe. Where did I touch you? On my ankle. Where did you say? Below, below my knee. (Patient is now allowed to look for the first time, as in all the previous tests to-day, owing to his position in bed, the tests were carried out the same as if he had been blindfolded.) He was allowed to sit up in bed; both limbs are extended in front of him. Now point where I touched you. The left index finger in a typical pointing position which he was unable to assume a few days ago. The left foot by this time he has put on the floor and with his left hand he points to mattress several inches to the left of his right foot or just at the spot where his left foot had previously been. Now both feet are placed in front of him and the examiner touches the right big toe. He understands what is done. Now you touch that toe? I will if I can. His right hand begins to fumble to the right of the foot among the bedclothes at the foot of the bed. What are you trying to do? I am trying to touch my big toe. While he fumbles the examiner grabs the right big toe. Patient is urged to find it. He makes violent efforts apparently toward bringing right arm over toward the foot, but it becomes entangled in the bed covers.

Lying outstretched on couch, eyes blindfolded: Lift both legs? Instead of doing so he waves arms in the air. What are you trying to do? Do what you told me to do. What was that? To lift my legs. Well, you're not doing it? I know that too (laughs). Blindfold removed. Now lift both legs? (A pause.) Lift your legs? I'm trying but I can't find them. Blindfold replaced. Now, lift both legs. After a pause he does so. Numerous trials were made in this test and it was found he could perform it as well with eyes shut as open. Blindfold removed. Raise your right leg? The examiner taps roughly the knee on that side when the command was given. He raises his left promptly. The command is given over again and he still raises his left leg. He makes the same mistake twice over again in the same command. Now raise both legs in the air? Correct. Blindfolded. Raise your left leg? Patient says, "My left leg." He starts to raise it but the right follows and he lifts both legs in the air, perseverating as he did in the above test. Now examiner pinches the left leg. Raise the one I'm pinching? Both legs come up. Now cross your ankles? I don't know whether I can or not. He starts to cross left over right but both legs are raised high in the air at the same time. Blindfold removed. Now cross one ankle over the other without raising your legs? (Pause.) He raises arms in the air. You haven't done it. I know I didn't—ain't that funny. Then a movement of the left foot, which becomes more pronounced until finally it crosses the right without lifting his thighs. Patient is now made to sit upright, the blindfold removed. Kick left foot out? Examiner indicates by touching which one is desired. Correct. Kick your right leg? Can't do this. He tries to get up. He makes violent movements of his body but the leg won't move. Examiner holds down the left leg, which tries to kick outward. Can't you do it? No, sir. "That other one is the one is trying that" (meaning that his left was trying to do what his right should). A few moments later when the patient was resting, the examiner stood behind him, patient unaware of his presence, and with the camel's hair brush tickled right ear, cheek, the back of the neck and right eyelid. There was no response and he did not scratch the areas irritated. The same was done on his left side and still no response. A moment later when the examiner appeared in front of him as if he had just entered the room, he asked the patient had he noticed anything peculiar a few moments before. "Why, yes, you were examining my head." What was I doing to you? He told exactly what was done.

Making movements after a definite object; material not at hand: July 26, 1912: He was asked how one would knock at a door; left hand to be used. Extends arm horizontally in front and gently raises and lowers tips of fingers. With the right there are wavy, hesitating movements of the arm, fingers extended and motionless. In the meantime, left hand held close by examiner is struggling to get free. *Catch a fly?* Left hand: Says, "I can't do it, and I ain't paralyzed; I don't know what's the matter with me." The arm is extended in front of him; the fingers wiggled somewhat. With the right he does not even make a motion of moving the arm. A fly lies on his knee. It is evident of course he can't see it, and is told to try and catch it. He slowly moves the left hand to the knee and picks at it with fingers wide apart as if he were about to grasp some large object. *Playing a Piano:* Left hand: There is a twisting motion of hand, the fingers not moving. With the right, the hand is held out in front of him, but otherwise there is no movement of the limb. *Playing the Imaginary Piano with Both Hands:* Hands immediately go to the sides of the head. Remarks, "There is the trouble, I can't keep my hands from my head." *Ringing a Bell:* Left hand: (Correct, with the exception of hand remaining open.) Is told he is not quite right and later closes the fist, thus doing it correctly. With the right makes the same mistake of not closing the hand. He is told: Double up your fists when you do it. "Don't I get it closed? I keep forgetting it every time." Now he performs the task quite well with right hand. *Grinding Coffee:* The old fashioned coffee-mill which sits on one's lap and held between the knees is explained to him and he remembers it quite well. Then he waves left flexed forearm up and down. Begins laughing, and remarks, "I ain't started to grind yet." Performing the task with his right he immediately raises his arm to head and says, "If I could keep my fingers out of my head all the time I would be all right, but I can't do it." *Cleaning the Teeth:* With the left: He first tries to bring the hand over to the right, which is held by the examiner; succeeds in touching it, and rubs the fingers over the back of right wrist. What did I tell you to do? "To clean my feet." (Here his deafness probably accounted for his misunderstanding of the question.) No, I said clean your *teeth.* "Oh, I beg your pardon, I didn't understand you." Now clean your teeth. Raises left index finger to mouth, touching an incisor tooth. For the same test with right hand, first brings hand up to necktie, which he pulls, then he fumbles around in the region of the examiner's hand, which holds his left, then rubs right hand over back of examiner's, perseverating from the left hand test. What are you trying to do? (Laughing heartily.) "I am trying to clean my teeth." *Brush Hair:* Correct with both hands. In connection with this it should be noted that this same movement frequently appears and appreciated by him when he is required to perform tasks in which motions about the head are not concerned. *Brush Coat:* He perseverates by brushing his hair. With the right makes the same mistake. What did I tell you to do? "To brush my coat." Are you doing it? (Laughing.) "No, I am brushing my hair." *Military salute:* Stands up when the command is given him. "I know what I ought to do but 'deed I can't do it." Does not bring either hand to head at first. Finally left hand goes to back of neck. Explains, "You ought to bring hand up to head, then down again but 'deed I can't show you." *Throw a Kiss:* "Doctor, I can't do it. I can't make my hand do it. I would if I could."

Making Definite Movements with Objects in His Hands: Light a Match: Names correctly match and box. Rubs thumbs and then fingers over box but is unable to open it. Holds it first with one hand while the fingers of the other try to manipulate, then reverses. He appears to be partial to the left hand for his desired opening movements. Fingers rub along the sides but do not reach the end of the box. Says that he can't get it open. Examiner pushes it halfway open. Fingers of left hand fumble among the matches, and yet he cannot pick one out. One is handed him and the box is closed. He rubs the wrong end on the top of the box and cannot turn over the match when directed to do so. Keeps turning the box over and over, then waves box up and down, the left hand holding the match is trying to catch it, so to speak, as it goes by. After trying for some minutes, fails to strike a match. *Knock on a Door:* With his left he slapped the door with the flat of his hand. With the right he fumbled around picking at the woodwork, making similar motions to one trying to scrape off a spot with the finger nails. He remembered correctly the command later. *The Use of a Pistol:* He names it correctly. It is handed to him in his right hand, fingers fail to grasp it, but wave about the handle, however. Before they take hold they have to be pressed about several times by the examiner, and then he grasps it upside down. The examiner wishing to start over again is about to take the pistol away but he is unable to release it and his fingers have to be separated by force (tonic perseveration); it is then laid conveniently in front of him. He runs his right hand over it, grasps the handle correctly, but upside down again. He is quite timid about it, continues asking assurance that it is not loaded, adding that one can never be too sure of these "unloaded" firearms. It is placed correctly in his right hand, but he does not lift it from his lap. Says it is too heavy. But this was not due to a muscular weakness, as later when the arm holding the pistol was raised in front for him, he held it there, waving it about for some moments. (It has been noted that this was a heavy old-fashioned '61 army cavalry pistol. Said it resembled those he often saw in the army.) With the left hand he grasped correctly the revolver, lying in front of him, but did not put finger on the trigger. His attention was called to this short-coming and he then transferred the handle to the right hand, running the fingers of the left over the muzzle; said, "I know all about firearms and I ought to find that trigger, but I can't. He goes all over it with the fingers of the left, then transfers his grasp upon the handle to the left hand. Now the index finger appears unconsciously to fall on the correct place. He then raises it somewhat and aims at the floor. *Tie a Knot in a String:* He makes the loop properly, holding it in both hands, but he does not slip the end through the loop. Works at it diligently but cannot succeed. A *comb* is handed to him in his right hand. Says it is a comb. He grasps it in his fingers as if it were a pencil; cannot bring it up to head. Says he can't do it but "Lord knows he ought to know how to comb his hair." Now he is told to do it with his other hand. He promptly takes it away with left hand and combs his hair quite correctly. While he holds it in his left, if he is told to comb with his right, he removes it with his right hand but repeatedly immediately transfers it to his left and combs his hair. Three or four times in succession he did this. Said he knew he was using the wrong hand. If while holding it with his left, he is told to take it away with his right, the fingers of the latter grasp it but the left hand pulls it away and carries it to the head. Now with the comb in his right hand the examiner makes the necessary movements for him, bringing the arm from his lap to the side of the head and combing for him. On each occasion just when the examiner let loose, the arm remained just where it was released and he was not able to approach his head nearer. Finally, the examiner made the motions for him while he held the comb on the top of his head. This was done several times and he was released while the comb was still stroking his hair. He was then able to continue the movement. Forty-five strokes, which he did quite correctly, were counted, and then the left quickly grasped it and took it away. (Here was demonstrated the good muscular power on the right side of the muscles which elevate the arm to the shoulder.) *Hair brush* is handed to him. Called it a clothes brush. Here was the first, and one of the extremely rare examples of not naming an object correctly. This toilet implement merely indicated to him something to brush with. It was the rather old fashioned type of brush with a handle. Are you sure it is a clothes brush, he was asked. "Sure it is, there's no mistake about that, it is." With his left hand he immediately brushed his hair with it, the wooden surface against hair. Inasmuch as he called it a clothes brush, yet used it as a hair brush, perseveration probably entered here, as he had just previously been using correctly a comb. After several trials with the bristles upward, during which he evidently appreciated that the position was wrong, without suggestion and help he turned it over with the bristles to his hair. Again he was asked if he was sure it was a clothes brush and he replied that it was. The suggestion was then made, why didn't he use it as a clothes brush if it was one, instead of brushing his hair with it. Yet he continued making the latter mistake. It was then transferred to his right hand and he could not bring the brush up to his head. There was very little movement at all. What's the matter, he was asked. "I can't bring it up to my head." The right hand holding the handle of the brush was then grasped by the examiner and the arm was carried several times from the lap to the back of the head, the bristles running over the hair, and when the examiner happened to release his hold, which occurred just as the hand was about mid-way to head, the hand stopped there and sufficient kinesthetic memories of the remaining movements necessary were not present to aid him in carrying out his purpose. The examiner now grasped the hand in the same manner again, but guided his hand back and forth over his hair several times, then suddenly let go. Now he continued without assistance and twenty-four strokes were counted. For part of this time, however, the brush slipped and the wooden back was against his hair. He was asked still again if this was a clothes brush and he replied that it was. Well, why don't you brush your clothes with it instead of your hair, and he excused himself very aptly and cleverly by replying, "Well, at times when I haven't a hair brush I use a clothes brush to brush my hair with," thus avoiding explanation for not using it correctly as a clothes brush, if he believed it such. In reality, his frequent inability to prevent his hands from coming to his head in tasks was believed to be a marked factor in producing what took place. A *clothes brush* was now handed him. Said, "Why that's just a brush." How do you use it? Brushes his hair with it as he had done with the hair brush. As he still brushes his hair with it, was asked what kind of a brush, and he replied correctly "clothes brush." Well, if it's a clothes brush use it as one. "All right, I will if I can." It was then taken from him and held before him, and he grasps it with left hand, which waves it about far off from his body in the air. He appears unable to succeed any better, and the examiner holds his own arm in front of patient, giving the suggestion that he should brush it. First he brushes the examiner's hand, but gradually went higher and finally brushed the arm correctly. Next he was told to brush his knees. He started the arm downward but did not reach his lower limbs, and started to brush the examiner's hand, which happened to lie on the arm of his chair. Remarked, "Well, ain't that funny I can't do it?" (Laughing heartily.) After much stammering and laughing finally said distinctly and with ease, "This is mixing business with pleasure, ain't it?" What did I tell you to do? "I am supposed to brush my clothes, but the Lord knows I ain't doing it"; and he ceased trying. Some minutes later when the examiner again took up the tests he was still holding the brush in his left hand. A *tooth brush* was now handed him, and when he called it a clothes brush this was the second time under my observation he mis-called the name of an object. Several days ago he promptly named it correctly. How do you use it? Brushes hair with it. No, that's not a hair brush, it's a tooth brush, he was corrected. (Just at this moment he scratched the corner of his right eye with his right index finger, a movement of bringing this hand to his eye he was unable to do upon command at almost every examination made of him recently.) "Well, I wouldn't dispute your word, but I would call that a clothes brush." (Here he asked for a drink of water.) A tin cup partially filled is placed upon his knees across which lay a light board. He grasped the cup with his left hand very clumsily and raised it directly to his mouth. The handle was in his way when it reached his lips, but he shoved it aside and drained the cup without spilling its contents. He then asked for another. It was placed before him again and he was required to use his *right* hand only this time. Could not grasp it. The index finger slipped into it and the cup would have upset in his endeavor to pick it up had not the examiner caught it in time. The fingers had to be squeezed about it as they, without assistance, seemed unable to grasp it. After his fingers caught hold he could not raise the arm, and so expressed himself. He was then told to drink as he pleased, and the struggling left hand, released by the examiner, quickly grasped the handle quite naturally and drank it down. It should be noted that with the use of the cup with the left hand there was no trembling as it was carried to the mouth. When he had finished the cup was withdrawn from the left hand and the tooth brush replaced it. He was told he held a tooth brush. Now use it correctly! Brushes hair with it. He was asked, Where are your teeth? He replied, "They are in my mouth, of course." Why don't you put the tooth brush in your mouth? "I can't do it, it beats anything I ever saw, but I can't do that; I took that tin cup and drank water out of it all right and everything you told me, but I can't get that tooth brush to my mouth." He is told to make another effort. This time touched his forehead with it and quickly carried it above, touching his hair. The tin cup was again placed before him and he was told to use it. Promptly with his left hand carried it to his mouth, holding it quite properly. As his arm came down the cup was removed and the tooth brush again replaced it. Now carry that tooth brush to your mouth! "Doc, I just can't do it; it's awful." (Is about to cry with vexation.) "I just keep brushing my hair with it."

July 27, 1912: To-day the tooth brush was again presented to him. Re-recognized it. He took it in one hand, then the other.

With left hand grasped it by bristles. Appreciated this was wrong, and then held it properly. Immediately carried it to his head; brushed his head vigorously. What are you doing? "I am brushing my hair." What did I tell you to do? "To do! brush my teeth with this tooth brush." Examiner takes it away and commands quickly, "Put it in your mouth!" Almost instantly carries it to the proper place, and in consequence is in much glee over his accomplishment, remembering that he was unable to do this before.

Driving a Nail: Recognizes both; the large nail in the right, the hammer in the left hand. He first wets the nail with his tongue, then with hammer held out in front he scratches the head of the nail on the head of the hammer. A moment later he holds the head of the nail against the board, appears unable to make the hammering motions with the left. Says he cannot do it. Is told, "Hammer the nail." "Well doing it and hitting the nail on the head is a different thing." With the nail laid aside he can give the correct hammering motions with either hand but the movements with the right are very awkward and clumsy. *Whisk Broom:* Says, "It's a hair brush." Here again was one of the very rare examples of mis-naming an object. He says he is positive about it. "You may have one name for it and I have another for it. That's all." Is told it is a whisk broom. Says, "Well, it may be but there's not much whisk to it (laughs)." Brush my coat with it. Rubs examiner's sleeve, the motions being confined to one spot and there are no wide, sweeping movements. Just previously when asked to brush his own clothes he waved it with the left hand about in the air. Then later while working on the examiner's sleeve with much stumbling of speech said, "Your clothes will be more dusty than when I started." With the broom in the right hand he could do nothing. Patient is now blindfolded. He wipes nose as well with the left hand as with open eyes; with the right he is unable to do anything with the handkerchief. Now, without telling him what he holds, a hair brush is placed in his left hand. He carries it immediately to his head, brushing his hair, but with the bristles up and while so engaged, in answer to an inquiry, said he had no idea what it was. Tooth brush was now substituted while he was still blindfolded. He used this article quite skillfully in brushing his hair, going over his entire head, but explained that he did not know what the object was. Blindfold removed and he was given a *cigarette* and *match box:* Names both correctly. Picks up cigarette with his left hand promptly, carries it to mouth, starts to put it in sideways, but then corrects himself. Licks the side of it. Is told that it is already rolled. "Oh, yes." Cannot pick up match from the box after much fumbling with fingers of left. Then one is handed him; scratches it on the table; is told that it is a safety match, but is unable to strike it on the box. It is lit for him;

starts to carry it to mouth, then lays it on the table; when the cigarette is lit for him he smokes it quite correctly. With the pipe he succeeded no better in lighting it without assistance. He put it in his mouth with left hand quite correctly, then puffed contentedly. *Tooth Brush:* "That's a tooth brush." Brushes hair with it. What should you brush with it? "My teeth." Continues brushing hair. What are you doing now? "Brushing my hair. I can't get it right. I keep on brushing my hair with it." He recognizes *ruler*. When told to measure table with it he carries it to the end of the table along the edge, places the ruler diagonally, one edge at the end and the other pointing towards the center of the table. Will go no further; says he can't read the ruler. Stick out your tongue: +. Touch your nose. Looks in front of him, first picks up tooth brush with left hand; lays that down. What are you doing? "Trying to touch my nose." Then picks up ruler; holds it with both hands in front of his face. What are you doing now? (Laughs.) "I am measuring my nose." Put hand on your ear? (Which one not designated.) Performs test correctly with left hand. Right hand: He opens palm previously closed, holds it off to one side, then makes same movement with left hand. Said afterwards he was trying to touch his ear. Touch knee: "I can't do it." You know what your knee is, don't you? "Of course, I do. It is on my leg." Touch top of your head: Promptly and correctly with each hand. Rub your stomach: Rubs head with both hands. (Laughs.) "I know that ain't right. I certainly know my stomach but I can't get there." Button up coat. Unable to do it with either hand alone. With both: Says, "I'll try." Arises from the chair. With left hand he first fumbles with handkerchief, which is in pocket. The right hand is at the same time moving towards a button. After much fumbling succeeds in buttoning one button. No trembling of fingers during this task. His great difficulty was keeping the left hand, which held the edge with the button hole, out of the way of the right. Seemed unable at first to bring the hole and the button together. Blindfolded: He was directed to walk. At first he said he could not move. After a few moments he started off and walked about the room, although, of course, furniture, etc., had to be moved out of his way. It is to be noted that with open eyes, notwithstanding his defective vision, he does not bump into furniture. Blindfolded and directed to extend his arms, then clasp hands in front of him: The first part of the test was carried out correctly with no tremors, but he could not bring hands together. Says, "I can't find them." Carried them to head. With open eyes he succeeded no better. Said, "I can't do it. They just go to my head." By imitation he was able to succeed somewhat better, but the arms move from his head to his lap instead of being separated wide at the shoulders before he brought them together. Does not sway standing with eyes closed.

August 9: The patient yesterday recognized and recalled correctly the name of his former nurse, whom he had not seen for over a month and this morning he had not forgotten her visit or her name. During the past ten days he has been more frequently disturbed and for longer periods than formerly. Two days ago in a rage he beat himself severely about the face with both fists. His nose bled and there appeared also a hemorrhage beneath the conjunctiva of the left eye in consequence. Although appetite is excellent he has lost much in weight. Complexion is extremely sallow. There does not appear to be any perceptible loss of strength and he walks about a great deal during the day.

The patient makes no attempt to dress himself without assistance and a few days ago when asked to make his toilet, his laugh was good-natured but implied that such a thing was preposterous. Remarked, "I'll do the best I can but I can't do it. I always have to be dressed. I get all tangled up in my clothes." He first tried his drawers, fumbling with them in endless ways. He was asked, "What are you trying to do?" Replied, "I am trying to find the opening." He grasped hold of one leg with one hand and the side of the garment with the other and tried to push the foot through the cloth. Then gave up trying with a laugh. When he started to put on his socks, he was seated with one ankle resting on the opposite thigh. He could not find the opening in the hose and tried to push his foot through the toe; could not find the tail of his shirt and although his arms were afterwards placed through the sleeves for him, he could not proceed further.

August 11: The patient is unable to eat unassisted, as otherwise he is very sloppy, dropping his food in his lap, etc. Sometimes he has been observed feeding himself but on these occasions only uses the left hand. Generally, if his tray is brought before the nurse is ready to feed him, he does not disturb it. When questioned as to his ability to eat alone, he says, "I can't feed myself. The nurse has to do it for me."

To-day for dinner he had soup, milk, mashed potatoes, beef, buttered bread, crackers, bananas and gelatine. He named correctly the articles of diet with the exception of the gelatine. Said, "I can't see well enough to tell what that is." He never makes any attempt to use his right hand at meals and to-day could not be induced to even try to employ this hand. With his left hand he could pick up the glass of milk, drink it quite correctly, and handle the spoon fairly well. There was no hesitancy whatever and he never missed carrying the food to his mouth. If the glass or spoon was placed in the right hand, he was totally unable to carry it to his mouth. He remarked, "I can't find my mouth with that hand." On one occasion the right hand holding the cracker was very near his mouth and when directed to bring it closer to face, he could not do so. Once during the meal while chewing his meat, one piece was evidently distasteful to him and he removed it from his mouth with his ***right hand*** quite naturally and placed it upon the side of his plate. It was noted at that moment the left was holding his spoon.

August 21, 1912: Since the last note was recorded, the patient's condition remains essentially the same. However, during the past ten days he has been less disturbed and in fact throughout the day he is generally happy and contented. Although he continues disoriented for time and place, he knows the nurses and attendants but cannot recall their names, however. His physician's name he generally remembers

SUMMARY AND CONCLUSIONS

A station engineer and steamfitter, of good habits and without venereal history, at the age of sixty-four suffered from an attack which did not render him unconscious, attended by a speech disturbance. The illness only lasted a few days and was not followed by lameness. Nothing more definite concerning paralysis, said to be "all over," could be learned. He was originally right-handed. It is impossible to state how much reliability can be placed upon his statement that he was called "Old Ambidexter."

Prior to the attack he wrote a very fair hand and evidently his education could be considered better than that of the average laborer. The speech disturbance did not clear up following the illness and he was thereafter "absentminded." Regarding writing, we know that he could sign his name two years after the illness but one year later (1907) his signature was almost illegible. We have been unable to learn whether the mental changes, appearing in August 1910, were sudden in onset or developed insidiously. At any rate, at that time he was recorded at the Home, "Senile with wandering propensities." At the time of transfer to this hospital (May 23, 1911) he presented stammering speech, complete bilateral agraphia, was poorly oriented, frequently forgetful of daily occurrences and memory poor and unreliable for distant past. He was quite infirm and walked about with short hesitating steps. Paralysis or pareses absent. He showed radial and temporal sclerosis; roughening of the aortic valves and nephritis. Pupillary anomalies, probably arteriosclerotic; double cataracts with reduction of vision to 2/20 both eyes, rendering examination of retina impossible and tests for hemianopia totally unreliable. Hearing equally impaired in both ears but he was not inconvenienced if one spoke a little louder than the average conversational voice. Sense of smell impaired in both nostrils but taste, as far as could be ascertained, was not affected. Knee kicks exaggerated: left > right. There is no organic loss of control of the bladder or rectal reflexes. During a little over a year's sojourn here there have been but little changes on the mental or physical side. No delusions or hallucinations present. The emotional tone is quite varying; generally at night and for an hour or so during the day, he is irritable and abusive. At night he is frequently untidy; he is unable to dress or undress without assistance.

We will now consider the following phenomena, which interest us more particularly:

Aphasia: He presents at present a rather mild, motor aphasia of a type of Broca. Understanding of spoken language is unimpaired. Spontaneous speech, as well as his ability to repeat is retained to a great extent, but there is much dysarthria at times and very rarely paraphasic utterances, which when they appear he appreciates and corrects without prompting. No misplacement of words. To what extent alexia, if present at all, exists, it is difficult to ascertain, owing to impaired vision. The aphasia as well as complete bilateral agraphia may be considered to be apractic.

Tactile sensibility disturbances of both upper and lower extremities, greater at the distal parts, sensation being more diminished in right upper extremity, particularly at tips of fingers.

Impairment of localization but retention of sense of position and perception of passive motion.

Tactile agnosia in both hands almost complete and notwithstanding failure to recognize objects touched, appreciates a few of their properties. In some instances, he recognized the form, whereas could not distinguish other properties and vice versa.

In spite of the absence of paralyses or pareses, which can be definitely excluded, there is noted a bilateral inability to perform certain motions or motion complexes, notwithstanding his complete understanding in each test of what was required of him. He was invariably questioned before to ascertain if he understood and frequently after he performed a task even in those tests he carried out correctly. Furthermore emphasis must be laid on the fact that notwithstanding the patient's psychic degeneration (consisting in disorientation in all spheres generally, very deficient judgment, poor memory, and great emotional instability), practically never during almost daily observations during the summer months of 1912 was I without his full coöperation in examinations, his attention being always quite good on these occasions. No matter how irritable and enraged he had been in the morning or even a short while before the examination, he always entered the examining room smiling and jolly, frequently understanding at the time the nature of the interview that was to follow. He never grew impatient or irritable over his shortcomings and retained throughout kindly feelings toward the examiner. Dr. Dynan's experience previously, as regards his attitude in apraxic tests, is in accord with mine.

Before making our diagnosis of apraxia, it is probably well to consider first ataxia, which I do not think exists in the case under consideration. We have first of all a frequent prompt execution of complicated motions with an inability to arrange the coördinated motions to a purpose. When in touching his nose or the tips of fingers of both hands after separating arms widely, etc., he either performs the task correctly and promptly or his motions are of a distorted type, failing to present any reference to the desired result. Liepmann[18] emphasizes that the appearance of the amorphous movements and mistaking of one movement for another speaks for apraxia. The ataxic patient is unstable generally in his movements, whereas the apractic may perform certain movements without the semblance of ataxia. If a patient is ataxic the simpler the movement, the less the ataxia; the more elaborate the movement, the greater the ataxia, but the apraxia of a patient bears no constant relation to the complexity of the movement and in this respect it is the case with my patient. Also in the patient in question, there are no tremblings or jerkings about his movements such as one frequently sees in ataxics and furthermore, closing the eyes in no way influences his results in the tests.

The differentiation from an ideatory disturbance is quite easy. Although the disorder is not one-sided, yet the difference in the manner in which the two sides carry out commands is very great. When he performed a task quite correctly with the left and was totally unable to do so with the right, eliminates a failure of understanding on the part of the patient and furthermore the simple statement that he knew exactly what he was expected to do and in many instances explained how it ought to be done, yet could not do it, permitted no doubt of the fact that ideational disturbances did not figure in the picture. However, ideational apractic phenomena cannot be absolutely ruled out and several examples of the same were thought to have been demonstrated. For instance, when he brought the cigarette to his mouth he licked it along its side as though he thought it necessary to finish what he took to be a "made" cigarette, which was in reality a manufactured one and removed from the box in front of his eyes. The instance, in which he called the tooth brush by its correct name and yet used it as a hair brush, is analogous to Pick's ideational apractic, quoted so frequently in the literature. Here the concepts tooth brush and hair brush were confused (Pick's patient used it as a beard brush) with a consequent confusion of movement. When the patient on several occasions called the tooth brush the clothes brush, and the whisk broom the hair brush, I am more inclined to think that his apraxia of speech accounted for the mistake. On a number of other occasions he named these three articles correctly and yet used them as a hair brush.

It is now important to note in what way do the disturbances of sensibility to touch and the tactile agnosia influence the motor disturbance. In the case under consideration we have no pronounced ataxia but we find prompt execution of complicated motions, but an inability to arrange them for a purpose. The frequency with which tactile agnosia accompanies motor apraxia, Goldstein[5] calls attention to and we find it in a case of Hartmann, Liepmann and Goldstein. The latter referring to Liepmann's patient notes that while the tactile agnosia markedly lessened the apraxia continued, thus showing that there was no necessary connection between the two. Kleist is also of the opinion that tactile agnosia does not condition apraxia.

We have then the following:

1. *Imitation of Movements* will be excluded from the discussion, as owing to defective vision, he excused himself from trying. It was quite evident he was unable to see fine and delicate movements, especially in tests with the fingers. Vision, however, was sufficient to allow him to recognize the meaning of several imitations performed in front of him with both hands,

the movements of which were widespreading, as fiddling, blowing cornets, sparring, etc. These imitations he was unable to copy.

2. *Imitating Passive Movements* were performed poorly with the left upper extremity; almost not at all with the right. The same was true of the lower limbs. With both hands together the results were not better. In these tests with each hand alone he always tried to help out with the other. Movements passively communicated to the right arm, he was occasionally able to copy with the left but he could not copy with the right movements communicated with the left.

3. *Reflexive Movements* generally poorly performed with the left hand and he succeeded no better in touching corresponding parts of examiner; was almost never successful with right hand.

4. *Movements Conditioned by Auditory Stimuli* and *Movements After a Definite Object, Material Not at Hand* resulted in dyspraxic phenomena on the left side, marked apraxia and frequent akinesis on the right. The deformations of motion were probably most frequently met with in these movements. In carrying out commands with the lower limbs his results varied but it might be said that he performed more movements correctly with the left leg than the right.

5. In *Definite Movements with Objects* we find the same faulty reactions with both hands together. If the right hand was alone used, there is generally akinesis. The left alone was frequently successful.

6. There were bilateral apractic disturbances frequently in the eyes, face and neck muscles, although with rare exceptions he was unable to close eyes upon command, he never failed to be able to protrude tongue. At times he could not bend body sideways to the right or the left; was frequently able to flex trunk but could rarely bend backwards.

7. The frequent appearance of *clonic perseverations,* and the rare occurrence of *tonic perseverations,* the latter phenomena being chiefly confined to the right hand.

The appearance of certain movements with the right upper extremity, which he on other occasions for all other purposes uses voluntarily very infrequently, are deserving of special mention. They were to be seen during every lengthy examination, and were performed apparently unconsciously on the part of the patient. These movements consist in frequent scratchings of the outer corner of the right eye with either the index or little finger of the right hand. Also there was noticed commonly a delicate tracing of the little finger on this side along the lower lashes of either the right or left eye, preferably the former. These movements are analogous to Goldstein and Liepmann's "Eigenleistungen." If immediately after scratching his eye or the end of his nose he was asked the cause of movements, he never seemed to know why he did so and denied that there was any itching or irritation there. And quite interesting was his total inability to do the same thing again upon command. The same is true when the left was required to perform the same movements, both hands instead usually going to the head. In connection with the oft-repeated carrying the hands to the head or the back of the neck appearing as entirely wrong movements in the past, an explanation is difficult. These movements were rarely observed appearing spontaneously, and generally only occurred as the end products of a task in which he was asked to do something quite different. In other words they were frequently repeated substituted motions, occurring when the patient went "off the rails," so to speak. In these movements, quite different from the scratching of his eyes with the right hand, he was always able to perform the same motion in the same way upon command. To a certain extent they remind one of the manner in which individuals carry their hands to their heads when perplexed in endeavoring to solve some mental problem. Especially this comparison might be made with the patient, who almost invariably appreciated his mistake and who sometimes paused a moment as if in thought as to the movements necessary for the command. Although it has been noted in the history that when carrying the hands to the head he made vigorous rubbing motions, these did not always occur and frequently the palms rested on temples a few moments, and were then carried away; and generally when the hands were carried to his head, that pause took place, when the fingers rested on the parietal region before the rubbing movement.

Regarding localization in our patient, unfortunately we are dealing with a man now aged seventy-two in whom pronounced intellectual deterioration has existed several years and as far back as eight years ago, following the aphasic attack, the statement that he was "absentminded" probably indicated mental enfeeblement.

At present on the mental side alone it would be natural to presuppose rather widespread cerebral lesions—atrophies and softenings, arteriosclerotic in origin. In this connection should be mentioned Pick's* patient, a senile dement with apraxia, in whom there was atrophy of the brain, accentuated in both frontal lobes, and the left inferior parietal lobe. It was less severe in the right inferior parietal lobe and both temporo-occipital lobes. Nothing abnormal was observed in the central convolutions, the superior parietal lobe, the cuneus and the precuneus.

In reference to his early and very probably his first lesion, which produced the aphasia, we would expect a left-sided focus at Broca's area, i. e., the foot of the third frontal convolution, eliminating those rare cases reported (Meyer[15] and others) where the lesion producing the aphasia was on the right side instead of the left. Indeed it is not unlikely that the apraxia may have existed these eight years before being recognized and if his faults in carrying out proper purposive movements were noted, they may simply have been recognized as one of the manifestations of his "senility." The probability that the apraxia existed several years before his entrance here is borne out by the apractic agraphia, marked evidences of which existed as far back as 1907, when he attempted to sign a pension voucher but after starting failed and his mark had to be substituted.

I infer that the lesions which could have produced his apraxia will also be responsible for the bilateral apraxia of writing, especially if a lesion exists in the corpus callosum.

We have seen that although his apraxia exists on both sides, we need not necessarily conclude that the lesions producing it were bilateral. Furthermore the disturbance is so far greater in the right upper extremity than in the left that at times it would not be unjustifiable to say the apraxia was unilateral. There exists very strongly in my mind the probability of left-sided lesions predominating as the etiological factors. Furthermore, it is quite likely that there exists a subcortical lesion in the corona radiata of the frontal lobe, where a part of its fibers are continuous with those of the corpus callosum, which connect the two hemispheres. A lesion so situated could produce an apraxia

* Quoted by Rhein.[21]

of the right upper extremity and a dyspraxia of the left without paralysis. Or else, if the original disturbance in this location was a slight hemorrhage from the edema surrounding it a transient right-sided paralysis could have existed to clear up in a day or so, as soon as the edema subsided. There would have remained then a right-sided apraxia and a left dyspraxia. It is to be noted that although we do not know if a right-sided paralysis existed, yet it could have been very possible, recalling the brief history concerning the attack that it was attended by temporary paralysis. Owing to our lack of knowledge concerning the early nature of his troubles, we have said we do not know if the apraxia began at the same time the aphasia was produced or resulted from a second lesion appearing later. If the two appeared conjointly the focus responsible for the aphasia could have also extended inward and upward in the left frontal lobe, thus adding apraxia to the picture.

With whatever apraxic lesion or lesions which may exist in the left hemisphere, it is quite important to bear in mind also softenings involving the corpus callosum in producing the symptom picture of this patient. Important to me is the connection which Hartmann's first case bears to mine and it will be remembered in his patient the retardation of intention on the right side of the body was very prominent and almost complete akinesis prevailed. This is true in my patient. However, his left-sided disturbances are more pronounced than in Hartmann's case. It will be recalled that a tumor of the left frontal brain was found in his case.

In conclusion we should not be deterred from appreciating the importance of the investigation of the apractic disorders in arteriosclerotics and the aged. And because an individual is demented the apraxia he may show is no less apraxia and is none the less deserving of study, and although we have not the anatomical findings to complete the case, it is nevertheless a contribution to the literature demonstrating striking motor disturbances in an individual not paralyzed.

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Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

January 7, 1913

The President, Dr. L. Pierce Clark, in the Chair

A CASE OF CHOLESTEATOMA OF THE BRAIN

By I. Strauss, M.D.

The patient was a woman, 32 years old at the time of her death, who was admitted to the Mt. Sinai Hospital on October 5, 1909. She was one of twins; the other was healthy. One brother was mentally deficient.

Her past history was unimportant. When she married, at the age of 22, her weight was 95 pounds. Menstruation began at fifteen and was regular until the birth of her second child, six or seven years ago. She had three children, living and well, the youngest sixteen months old. No miscarriages; never had any skin eruption; no cardiac, pulmonary or gastric disturbances.

Her present illness dated back to the birth of her second child, when she began to have menstrual disturbances, having periods every two or three months. There was no pain. During this time she became obese and was steadily growing stouter. She complained of headache, and about five months after the birth of her last child she first showed signs of mental derangement. She lost her memory and talked garrulously and incoherently, and was committed to an asylum in Central Islip, where she remained about nine months. During her stay in the hospital she had pneumonia, from which she recovered without complications. Since her return home her headaches had increased in severity and recurred more frequently. She often vomited small quantities of food; vomiting was not projectile in character. For the past six months she gnashed her teeth almost continually, stopping only during conversation and mastication. Her eyesight had been gradually growing poorer. Her memory was fair, but she forgot recent happenings and took very little interest in current events. She complained of pain in the jaws and of some difficulty in chewing and swallowing. She was also subject to earache. She had great thirst, drank considerably and voided copiously. Perspiration was profuse. The bowels were constipated. She had not menstruated in four months. She continued to gain weight, although not as rapidly as formerly.

The patient's facial appearance, at the time of her admission to Mt. Sinai Hospital, was suggestive of acromegaly. The lips were thick, the upper jaw seemed wider than normal, and her nose was thick and broad. The teeth were regularly placed and were ground from the constant gnashing. The hair was coarse and sparse, and there was a considerable growth on her upper lip. The axillary and pubic hair was likewise sparse. Her mentality was dull and sluggish. She was indifferent to her surroundings, and her attention was easily distracted. She was oriented, but her memory was very deficient. The subcutaneous fat was very sensitive. The uterus was small. The blood pressure was 90, and the temperature averaged about 98.3. There were some atrophy and weakness of the right leg, with diminished reflexes, suggestive of an old anterior poliomyelitis. Glycosuria was present. The fundi were negative, although on account of the restlessness of the patient, neither a satisfactory examination of the visual fields nor an X-ray examination could be made.

Dr. Strauss said the diagnosis of pituitary tumor was based on the early appearance of Froelich's syndrome, the character of the facies and the symptoms of increased intracranial pressure. The unusual feature was the development of a true diabetes.

In April, 1910, the patient was transferred to the Montefiore Home, where it was ascertained that she had a positive Wassermann reaction in the blood (negative in the cerebrospinal fluid), and that there was not much doubt that her husband had been luetic. At this time the right eye showed atrophy of the disc; the left a commencing atrophy, and there appeared to be a bilateral temporal hemianopsia. She remained in a stationary state for some time, when she suddenly became somnolent and developed a marked edema of the face and lips. She came out of this state after a few days and was given an intramuscular injection of salvarsan. The improvement in her mental condition produced by this was very remarkable: she took cognizance of her surroundings, her memory improved, she thanked the physicians for what they had done for her and felt sure that she could return home in a short time. The glycosuria gradually disappeared, and she was maintained on an anti-diabetic diet.

Six months later there again suddenly appeared an extensive edema of both upper eyelids. There were subconjunctival hemorrhages, the pupils were moderately contracted and she became comatose, with stertorous breathing, loss of all reflexes and incontinence; no sugar. A phlebotomy was performed, bicarbonate of soda and diuretin were administered, and in two days the edema had disappeared, the patient came out of her coma and was mentally clearer than she had been in six months. During the succeeding three months she was given several injections of salvarsan, together with mercury in different forms. She remained fairly clear mentally and her general condition was good. Sugar was absent for considerable periods of time, and if present, it was only in small amounts. There was very little headache or dizziness. Early in December, 1911, she became semistuporous and slept a good deal. The stuporous condition became more marked, and death occurred on December 21.

At the autopsy, which was confined to the head, a tumor was found on the under surface of the brain. It presented as a cystic and gelatinous mass, extending from the medulla at the inferior level of the olivary bodies forward as far as the optic chiasma. The main prominence of the tumor presented itself on the left side of the pons, in the interpeduncular space. The tumor compressed the pons, especially on the left side, although also some of the right half of the pons had been destroyed. The destruction of the pons on the left side extended inward to about half its width. In this region the tumor was both cystic and solid, the cyst being about 1.5 cm. in diameter. The solid part of the tumor was yellowish in some places and darker in others, where it was of a gelatinous appearance, and there were numerous small, yellow areas scattered throughout the mass in this region, which contained hard, calcareous substance. The third nerves could be seen coming out on either side of the mass. The main body of the tumor occupied the region of the basal ganglia on the left side. The left lenticular and caudate nuclei were compressed and displaced laterally, and the left internal capsule was missing in its lower two thirds. The fornix and septum lucidum were displaced to the right and the optic thalamus appeared to be completely replaced by the tumor. In one portion, the tumor broke through the floor and lateral wall of the left ventricle, and projected as a mass the size of a pea into the ventricular cavity. The tumor extended forward into the frontal lobe almost to the frontal pole on a level with the second frontal convolution. The tumor measured about 5 cm. in its longest diameter, from above downward: its greatest width was 4 cm. It appeared to be encapsulated, the capsule above being a thin bridge of brain tissue one and a half mm. in thickness, which formed the floor of the left ventricle. The hypophysis seemed to be of about normal size, but somewhat flattened. Microscopically, the growth proved to be a cholesteatoma, possibly of embryonal origin.

A CASE FOR DIAGNOSIS

By Foster Kennedy, M.D.

The patient was a married woman, 35 years old, who had enjoyed good health up to about one year ago, when she began to suffer from very severe headaches, and six months later there was added to these intense attacks of vertigo, with frequent vomiting. Three weeks ago she first noticed that her left eyelid drooped, and that there was weakness of the left face, which became twisted when she laughed.

She now complained of severe headaches, intense dizziness, frequent vomiting, and incomplete paralysis of the left third nerve. Her reflexes were normal. There was no ataxia. Her speech was normal. The Wassermann reaction was negative and an examination of the cerebrospinal fluid gave negative results. There was slight inequality of the pupils, the left being smaller and more sluggish than the right. There was no nystagmus.

Dr. Kennedy said this patient had been under his observation for only a short time, and he had made a very tentative diagnosis of pontine tumor.

Dr. I. Abrahamson said the case shown by Dr. Kennedy recalled to his mind that of a child that was brought to the clinic with a paralysis of the sixth and seventh nerves on the right side, followed in the course of two weeks by headaches of increasing severity. The symptoms were first regarded as of peripheral origin. Subsequently, the child had a convulsion, with hyperesthesia and right-sided paralysis, the symptoms pointing to a pontine tumor. The patient was growing progressively weaker, and a fatal outcome was expected.

In another case, which Dr. Abrahamson said he had presented at a previous meeting of this Society, the patient was a woman with a progressive bilateral ophthalmoplegia externa. She gave a history of severe headaches, followed by ptosis and weakness of one side of the face. After a temporary improvement she developed a similar condition on the opposite side of the face. The headaches were of an intermittent character.

In Dr. Kennedy's case, the speaker said he was inclined to believe that there was a neoplasm involving the pons.

Dr. William M. Leszynsky suggested that the symptoms were due probably to a syphilitic basal meningitis.

A CASE OF EXTRA-CEREBELLAR TUMOR: OPERATION: RECOVERY

By Foster Kennedy, M.D.

A boy, 19 years old, was admitted to the New York Neurological Institute on June 12, 1912. The history obtained was that he had always been bright, but not overstudious. He was fond of music, and quite an accomplished violinist. His general health had been good. Four years ago he received a severe blow on the head, and at that time it was noticed that his right upper eyelid drooped. When a small boy he told his father that he could not see through a pair of opera glasses with both eyes, and at a subsequent examination, made by an oculist, it was said that the sight of his right eye was practically gone. There was no history of headaches nor convulsions during infancy or childhood.

The boy's present illness dated back to March 18, 1912, when he attended a party and ate a good deal. On the following day he complained of persistent headache, which at first was in the left temporo-frontal region, later extending to the left side of the face and neck to the mid-line. The headache had persisted more or less constantly, but there were intervals during which he was free from it. Between the onset of his illness and April 1 he had vomited once. Early in May it was noticed that he could not play the violin well on account of the inability to grasp with the left hand. A few days later it was noticed that he wobbled in walking; this symptom became more pronounced, and the father stated that the patient fell to the left. About two weeks later he had a severe vomiting spell, with much pain in the head; since then he had vomited only four times, always late at night.

When Dr. Kennedy first saw the patient, on June 10, 1912, an examination of the eyes showed a choroiditis, with heaping of retinal pigment in the right eye, and the pupil was more sluggish than that of the left. There was occasional slight nystagmus to the left; never to the right. There was slight infranuclear weakness of the left face, with deviation of the jaw to the same side. There was ataxia of the left arm and leg, with a tendency to fall to the left side. No sensory changes were found.

On June 14 the patient complained of severe headache in the frontal and occipital regions, but more frontal than occipital, and there was marked projectile vomiting. There was now gross coarse nystagmus on looking to the left. There was no impairment of smell. The eyes now showed definite blurring of the discs, with small striate hemorrhages. The pulse was slow. The left knee jerk was slightly more active than the right.

On June 15, 1912, the patient was operated on by Dr. Charles A. Elsberg, the idea being to relieve intra-cranial pressure. Upon making an opening over the left occipital region, there was enormous pressure, and the left cerebellar lobe immediately protruded to such an extent that it was almost strangulated before the dura could be incised. The left cerebellar lobe was then seen to be apparently the seat of an infiltrating tumor, apparently a glioma, extending from before backwards. Some of this tissue was removed and the wound was closed. The patient made an uneventful recovery from the operation, with the exception of a slight rise in temperature, with occasional vomiting, on the fourth day. On June 25 his temperature had again fallen to normal; there was no vomiting nor pain. On July 2 the ataxia was less marked and there was a general improvement in the patient's condition. There was no pain nor vomiting, and he was able to sit up voluntarily without effort or dizziness. He left the hospital on July 6.

The patient's present condition is entirely satisfactory. He considers himself practically well, and has resumed his violin practice.

Microscopic report: No gliomatous tissue was found in the specimen, so this good result is entirely produced by simple decompression, the growth being still in front of the exposed cerebellar lobe.

The President, Dr. L. Pierce Clark, said that in dealing with slow-glowing tumors of the cerebellum, especially in early life, it was difficult to say just what was going on either in the tumor or cerebellum itself by the symptoms presenting, as the frontal lobes of both sides were closely connected with both cerebellar lobes and had reciprocating functions. Though the cerebellum made little recovery after tumor removal, it was quite possible for the frontal brain to take up cerebellar functions of equilibration and defective muscle tonus and regulate the same through the cerebro-cerebellar-pontine tracts.

A CASE OF ACOUSTIC NEUROMA

By I. Abrahamson, M.D.

A girl, 19 years old, a native of Bohemia and a domestic by occupation, had suffered from headaches and tinnitus for over two years. Subsequently she complained of vomiting and vertigo and of increased noises in the left ear, with diminution of hearing. For four months she had complained of visual disturbances, with gradual loss of sight. The gait was unsteady, with staggering towards the left side. The vision of the left eye was less than that of the right. For the past two months there had been amenorrhea.

Examination of the eyes showed double choked disk, with consecutive atrophy, most marked on the left side. It was impossible to map out the fields, owing to poor vision, the patient being scarcely able to count fingers. The ocular movements showed coarse nystagmus to the extreme left; less marked to the right. The pupils were large; some reaction to light was present. Smell was impaired; taste was normal. There was corneal hypesthesia. The right face was flattened; there was spasm of the left face. Hearing was very defective on the left side; that on the right was somewhat diminished. The head was held in the left cerebellar attitude; there was a cerebellar gait, with a tendency to fall mainly to the left. There was no hypotonus; no ataxia There was some weakness on the right side. Sensation was intact and the sphincters normal. The deep reflexes were slightly increased; no Babinski. The Wassermann reaction was negative.

Dr. Abrahamson said the symptoms in this case were typical of an acoustic neuroma. The absence of facial paralysis on the left side was not unusual. Because of the advanced optic neuritis, the advisability of an operation was doubtful.

The following officers were elected for the ensuing year: President, Dr. Smith Ely Jelliffe; first vice-president, Dr. E. G. Zabriskie; second vice-president, Dr. E. W. Scripture; corresponding secretary, Dr. J. Ramsay Hunt; recording secretary and treasurer, Dr. C. E. Atwood; councillors, Drs. Dana, Starr, Bailey, Frenkel and Kennedy.

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

of Vienna

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(Continued from p. 196)

Kyros

The myth of Kyros, which the majority of investigators place in the center of this entire mythical circle, without entirely sufficient grounds, it would appear—has been transmitted to us in several versions. According to the report of Herodotus (about 450 B.C.), who states (I, 95) that among four renderings known to him, he selected the least "glorifying" version, the story of the birth and youth of Kyros is as follows, I, 107 et seq.[88]

Royal sway over the Medes was held, after Kyaxares, by his son Astyages, who had a daughter named Mandane. Once he saw, in a dream, so much water passing from her as to fill an entire city, and inundate all Asia. He related his dream to the dream interpreters among the magicians, and was in great fear after they had explained it all to him. When Mandane had grown up, he gave her in marriage, not to a Mede, his equal in birth, but to a Persian, by name of Kambyses. This man came of a good family and led a quiet life. The King considered him of lower rank than a middle class Mede. After Mandane had become the wife of Kambyses, Astyages saw another dream vision in the first year. He dreamed that a vine grew from his daughter's lap, and this vine overshadowed all Asia. After he had again related this vision to the dream interpreters, he sent for his daughter, who was with child, and after her arrival from Persia, he watched her, because he meant to kill her offspring. For the dream interpreters among the magicians had prophesied to him that his daughter's son would become king in his place. In order to avert this fate, he waited until Kyros was born, and then sent for Harpagos, who was his relative and his greatest confidant among the Medes, and whom he had placed over all his affairs. Him he addressed as follows: " My dear Harpagos, I shall charge thee with an errand which thou must conscientiously perform. But do not deceive me, and let no other man attend to it, for all might not go well with thee. Take this boy, whom Mandane has brought forth, carry him home, and kill him. Afterwards thou cans't bury him, how and in whatsoever manner thou desirest." But Harpagos made answer: " Great King, never hast thou found thy servant disobedient, and also in future I shall beware not to sin before thee. If such is thy will, it behooves me to carry it out faithfully." When Harpagos had thus spoken, and the little boy with all his ornaments had been delivered into his hands, for death, he went home weeping. On his arrival he told his wife all that Astyages had said to him. But she inquired, " What art thou about to do?" He made reply: " I shall not obey Astyages, even if he raved and stormed ten times worse than he is doing. I shall not do as he wills, and consent to such a murder. I have a number of reasons: in the first place, the boy is my blood relative; then, Astyages is old, and he has no male heir. Should he die, and the kingdom go to his daughter, whose son he bids me kill at present, would I not run the greatest danger? But the boy must die, for the sake of my safety. However, one of Astyages' men is to be his murderer, not one of mine."

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[88] F. R. Lange, "Herodot's Geschichten" (Reclam). Compare also Duncker's "History of Antiquity" (Leipsig, 1880), N. 5, page 256 et sequitur.

Having thus spoken, he at once despatched a messenger to one of the king's cattle herders, by name Mithradates, who, as he happened to know, was keeping his herd in a very suitable mountain pasturage, full of wild animals. The herder's wife was also a slave of Astyages', by name Kyno in Greek, or Spako (a bitch) in the Medean language. When the herder hurriedly arrived, on the command of Harpagos, the latter said to him: " Astyages bids thee take this boy and expose him in the wildest mountains, that he may perish as promptly as may be, and the King has ordered me to say to thee: If thou doest not kill the boy, but let him live, in whatever way, thou art to die a most disgraceful death. And I am charged to see to it that the boy is really exposed." When the herder had listened to this, he took the boy, went home, and arrived in his cottage. His wife was with child, and was in labor the entire day, and it happened that she was just bringing forth, when the herder had gone to the city. They were greatly worried about each other. But when he had returned and the woman saw him again so unexpectedly, she asked in the first place why Harpagos had sent for him so hurriedly. But he said: "My dear wife, would that I had never seen what I have seen and heard in the city, and what has happened to our masters. The house of Harpagos was full of cries and laments. This startled me, but I entered, and soon after I had entered, I saw a small boy lying before me, who struggled and cried and was dressed in fine garments and gold. When Harpagos saw me, he bid me quickly take the boy, and expose him in the wildest spot of the mountains. He said Astyages had ordered this, and added awful threats if I failed to do so. I took the child and went away with it, thinking that it belonged to one of the servants, for it did not occur to me whence it had come. But on the way, I learned the entire story from the servant who led me from the city, and placed the boy in my hands. He is the son of Mandane, daughter of Astyages, and Kambyses the son of Kyros; and Astyages has ordered his death. Behold, here is the boy."

Having thus spoken, the herder uncovered the child and showed it to her, and when the woman saw that he was a fine strong child, she wept, and fell at her husband's feet, and implored him not to expose it. But he said he could not do otherwise, for Harpagos would send servants to see if this had been done; he would have to die a disgraceful death unless he did so. Then she said again: "If I have failed to move thee, do as follows, so that they may see an exposed child: I have brought forth a dead child; take it and expose it, but the son of the daughter of Astyages we will raise as our own child. In this way, thou wilt not be found a disobedient servant, nor will we fare ill ourselves. Our still-born child will be given a kingly burial, and the living child's life will be preserved." The herder did as his wife had begged and advised him to do. He placed his own dead boy in a basket, dressed him in all the finery of the other, and exposed him on the most desert mountain. Three days later he announced to Harpagos that he was now enabled to show the boy's cadaver. Harpagos sent his most faithful body guardians, and ordered the burial of the cattle herder's son. The other boy, however, who was known later on as Kyros, was brought up by the herder's wife. They did not call him Kyros, but gave him another name.

When the boy was twelve years old the truth was revealed, through the following accident. He was playing on the road, with other boys of his own age, in the village where the cattle were kept. The boys played "King," and elected the supposed son of the cattle herder.[84]

But he commanded some to build houses, others to carry lances; one he made the king's watchman, the other was charged with the bearing of messages; briefly, each received his appointed task. One of the boy's playmates, however, was the son of Artembares, a respected man among the Medes, and when he did not do as Kyros ordained, the latter made the other boys seize him. The boys obeyed, and Kyros chastised him with severe blows. After they let him go, he became furiously angry, as if he had been treated improperly. He ran into the city and complained to his father of what Kyros had done to him. He did not mention the name of Kyros for he was not yet called so, but said the cattle herder's son. Artembares went wrathfully with his son to Astyages, complained of the disgraceful treatment, and spoke thus: "Great king, we suffer such outrageous treatment from thy servant, the herder's son," and he showed him his own son's shoulders. When Astyages heard and saw this, he wished to vindicate the boy for the sake of Artembares, and he sent for the cattle herder with his son. When both were present, Astyages looked at Kyros and said: "Thou, a lowly man's son, hast had the effrontery to treat so disgracefully the son of a man whom I greatly honor!" But he made answer: "Lord, he has only received his due. For the boys in the village, he being among them, were at play, and made me their king, believing me to be the best adapted thereto. And the other boys did as they were told, but he was disobedient, and did not mind me at all. For this he has received his reward. If I have deserved punishment, here I am at your service."

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[84] The same "playing king" is found in the Hindoo myth of Candragupta, the founder of the Maurja dynasty, whom his mother exposed after his birth, in a vessel at the gate of a cowshed, where a herder found him and raised him. Later on he came to a hunter, where he as cowherder played "king" with the other boys, and as king ordered that the hands and feet of the great criminals be chopped off. [The mutilation motive occurs also in the Kyros saga, and is generally widely distributed.] At his command, the separated limbs returned to their proper position. Kanajka, who once looked on as they were at play, admired the boy, and bought him from the hunter for one thousand Kârshâpana; at home he discovered that the boy was a Maurja. (After Lassen's Indische Altertumskunde, II, 196, Annotation 1.)

When the boy spoke in this way, Astyages knew him at once. For the features of the face appeared to him as his own, and the answer was that of a highborn youth; furthermore, it seemed to him that the time of the exposure agreed with the boy's age. This smote his heart, and he remained speechless for a while. Hardly had he regained control over himself, when he spoke to get rid of Artembares, so as to be able to question the cattle herder without witnesses. "My dear Artembares," he said, "I shall take care that neither thou nor thy son shall have cause for complaint." Thus he dismissed Artembares. Kyros, howover, was led into the palace by the servants, on the command of Astyages, and the cattle herder had to stay behind. When he was all alone with him Astyages questioned him whence he had obtained the boy, and who had given the child into his hands. But the herder said that he was his own son, and that the woman who had borne him was living with him. Astyages remarked that he was very unwise, to look out for most cruel tortures, and he beckoned the sword bearers to take hold of him. As he was being led to torture, the herder confessed the whole story, from beginning to end, the entire truth, finally beginning to beg and implore forgiveness and pardon. Meanwhile Astyages was not so incensed against the herder, who had revealed to him the truth, as against Harpagos; he ordered the sword bearers to summon him, and when Harpagos stood before him, Astyages asked him as follows: "My dear Harpagos, in what fashion hast thou taken the life of my daughter's son, whom I once delivered over to thee?" Seeing the cattle herder standing near, Harpagos did not resort to untruthfulness, for fear that he would be refuted at once, and so he proceeded to tell the truth. Astyages concealed the anger which he had aroused in him, and first told him what he had learned from the herder; then he mentioned that the boy was still living, and that everything had turned out all right. He said that he had greatly regretted what he had done to the child, and that his daughter's reproaches had pierced his soul. "But as everything has ended so well, send thy son to greet the newcomer, and then come to eat with me, for I am ready to prepare a feast in honor of the Gods who have brought all this about."

When Harpagos heard this, he prostrated himself on the ground before the king, and praised himself for his error having turned out well, and for being invited to the king's table, in commemoration of a happy event. So he went home, and when he arrived there, he at once sent off his only son, a boy of about thirteen years, telling him to go to Astyages, and to do as he was bid. Then Harpagos joyfully told his wife what had befallen him. But Astyages butchered the son of Harpagos when he came, cut him to pieces, and roasted the flesh in part; another portion of the flesh was cooked, and when everything was prepared he kept it in readiness. When the hour of the meal had come, Harpagos and the other guests arrived. A table with sheep's meat was arranged in front of Astyages and the others, but Harpagos was served with his own son's flesh, without the head, and without the choppings of hands and feet, but with everything else. These parts were kept hidden in a basket. When Harpagos seemed to have taken his fill, Astyages asked him if the meat had tasted good to him, and when Harpagos answered that he had enjoyed it, the servants, who had been ordered to do so, brought in his own son's covered head, with the hands and feet, stepped up to Harpagos, and told him to uncover and take what he desired. Harpagos did so, uncovered the basket, and saw the remnants of his son. When he saw this, he did not give way to his horror, but controlled himself. Astyages then asked him if he knew of what game he had eaten; and he replied that he knew it very well, and that whatever the king did was well done. Thus he spoke, took the flesh that remained, and went home with it, where he probably meant to bury it together.

This was the revenge of Astyages upon Harpagos. Concerning Kyros, he took counsel, and summoned the same magicians who had explained his dream, then he asked them how they had at one time interpreted his vision in a dream. But they said that the boy must become a king, if he remained alive, and did not die prematurely. Astyages made reply: "The boy is alive, and is here, and as he was staying in the country, the boys of the village elected him for their king. But he did everything like the real kings, for he ordained to himself as the master, sword bearers, gate keepers, messengers, and everything. How do you mean to interpret this?" The magicians made reply: "If the boy is alive, and has been made king without the help of anyone, thou canst be at ease so far as he is concerned, and be of good cheer, for he will not again be made a king. Already several prophecies of ours have applied to insignificant trifles, and what rests upon dreams is apt to be vain." Astyages made reply: "Ye sorcerers, I am entirely of your opinion that the dream has been fulfilled when the boy was king in name, and that I have nothing more to fear from him. Yet counsel me carefully as to what is safest for my house and for yourselves." Then the magicians said: "Send the boy away, that he may get out of thy sight, send him to the land of the Persians, to his parents." When Astyages had heard this, he was greatly pleased. He sent for Kyros, and said to him: "My son, I have wronged thee greatly, misled by a deceitful dream, but thy good fortune has saved thee. Now go cheerfully to the land of the Persians; I shall give thee safe conduct. There wilt thou find a very different father, and a very different mother than the herders, Mithradates and his wife." Thus spake Astyages, and Kyros was sent away. When he arrived in the house of Kambyses, his parents received him with great joy when they learned who he was, for they believed him to have perished at that time, and they desired to know how he had been preserved. He told them that he had believed himself to be the son of the cattle herder, but had learned everything on the way from the companions whom Astyages had sent with him. He related that the cattle herder's wife had saved him, and praised her throughout. The bitch (Spako) played the principal part in his conversation. The parents took hold of this name, so that the preservation of the child might appear still more wonderful, and thus was laid the foundation of the myth that the exposed Kyros was nursed by a bitch.

Later on, Kyros, on the instigation of Harpagos, stirred up the Persians against the Medes. War was declared, and Kyros, at the head of the Persians, conquered the Medes in battle. Astyages was taken a prisoner alive, but Kyros did not harm him, but kept him with him until his end. Herodotus's report concludes with the words: "But from that time on the Persians and Kyros reigned over Asia. Thus was Kyros born and raised, and made a king."

The report of Pompeius Trogus is preserved only in the extract by Justinus.[35] Astyages had a daughter but no male heir. In his dream he saw a vine grow forth from her lap, the sprouts of which overshadowed all Asia. The dream interpreters declared that the vision signified the magnitude of his grandson, whom his daughter was to bear; but also his own loss of his dominions. In order to banish this dread, Astyages gave his daughter in marriage neither to a prominent man, nor to a Mede, so that his grandson's mind might not be uplifted by the paternal estate besides the aternal; but he married her to Kambyses, a middle-class man from the then unknown people of the Persians. But this was not enough to banish the fears of Astyages, and he summoned his pregnant daughter, in order to have her infant destroyed before his eyes. When a boy had been born, he gave him to Harpagos, his friend and confidant, to kill him. For fear that the daughter of Astyages would take revenge upon him for the death of her boy, when she came to reign after her father's death, he delivered the boy to the king's herder for exposure. At the same time when Kyros was born, a son happened to be born also to the herder. When his wife learned that the king's child had been exposed, she urgently prayed for it to be brought to her, that she might look at it. Moved by her entreaties, the herder returned to the woods. There he found a bitch standing beside the child, giving it her teats, and keeping the beasts and birds away from it. At this aspect he was filled with the same compassion as the bitch; so that he picked up the boy and carried him home, the bitch following him in great distress. When his wife took the boy in her arms, he smiled at her as if he already knew her; and as he was very strong, and ingratiated himself with her by his pleasant smile, she voluntarily begged the herder to (expose her own child instead and)[36] permit her to raise the boy; be it that she was interested in his welfare, or that she placed her hopes on him. Thus the two boys had to exchange fates; one was raised in place of the herder's child, while the other was exposed instead of the grandson of the king.

(*To be continued*)

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[35] Justinus, "Extract from Pompeius Trogus' Philippian History," I, 4-7. As far as results from Justinus' extract, Domon's Persian tales (written in the first half of the fourth century before Christ) are presumably the sources of Trogus' narrative.

[36] The words in parenthesis are said to be lacking in certain manuscripts.

Periscope

Revue Neurologique

(June 30, 1912)

1. The Afflictive Emotions. J. **Tastevin.**
2. Critical Study of the Physiology of Some Organic Symptoms of the Upper Limb. **Noïca.**

1. *Afflictive Emotions.*—Under this name are grouped those characterized: first, by a common intellectual element, the idea of an evil touching the person afflicted; and second, a fundamental affective element, a sensation of painful constriction localized in the epigastrium. These emotions are: chagrin, for which the fundamental idea is the feeling of an evil in the past; anxiety, in various degrees and varieties, which is determined by the idea of evil in the future; and enervation, using the word in the popular sense, which is determined by an idea of present evil. These emotions may occur in normal individuals and in various pathologic states. A rational treatment is the use of analgesics and antispasmodics and local anesthetics internally or hot and cold applications to the epigastrium externally.

2. *Physiology of Some Organic Symptoms of the Upper Limb.*—Noïca insists that the sign of Raïmiste and the sign of Neri do not depend upon a hypertonicity of the flexors or upon an inequality of tonus but are due to the anatomical position of the bones of the wrist. He finds these signs present in all cases where there is complete loss of power in the flexors and extensors of the hand—in deep anesthesia, in cadavers after rigor mortis has passed off, and in cases of extreme muscular atrophy.

(July 15, 1912)

1. A New Pontile Syndrome, an Abnormal Form of Dissociation of Sensation, Hemiataxia on the Side Opposite to the Lesion, Paralysis of the Lateral Movements of the Eyes. **Brault** and **Ch. Vincent.**
2. The Superposition of Motor and Sensory Disturbances of Radicular Distribution in a Case of Syringomyelia. G. **Mattirolo.**

1. *New Pontile Syndrome.*—The patient, a man thirty-one years old and not syphilitic, suffered a stroke, without loss of consciousness, followed by paralytic phenomena from which he recovered in about three weeks. About six weeks after the first attack he had a second, resulting in phenomena similar to those caused by the first attack. Examination showed: a paralysis of both external recti; a slight palsy of the left side of the face; a slight right hemiparesis; a dissociation of sensation in the extremities on the right side; tactile sensation and the sense of motion and position were lost but pain sense was normal; a hemiataxia on the right side which was made worse by closing the eyes.

2. *Motor and Sensory Disturbances of Radicular Distribution.*—In a case diagnosed clinically as syringomyelia, the areas of sensory disturbance corresponded with the topographical distribution of certain posterior nerve roots; the atrophy and paralysis to the distribution of the anterior nerve

roots at the same level. The case demonstrates that the theory of Dejerine that each spinal segment represents in its anterior horn the origin of the motor root of the same segment and is therefore the center of innervation of the muscle group to which that root is distributed, and in its posterior horn a cutaneous projection the topography of which is identical with the corresponding posterior root is correct.

(July 30, 1912)

1. Contracture with Increase of the Tendon Reflexes and Contracture with Increased Cutaneous Reflexes. J. Babinski.
2. Contribution to the Study of the Neurological Complications of Acute Malaria. Dumolard, Aubry and Trolard.

1. *Tendon Reflexes and Cutaneous Reflexes.*—The author has published reports of several cases in which there was a diminution of the tendon reflexes and an increase in the cutaneous reflexes of defense. The one recorded in this paper is that of a woman, forty-eight years of age, who developed a progressive weakness in the right arm and in both legs. The tendon reflexes were diminished and finally abolished. There was no atrophy. Babinski's toe reflex was present. Irritation of the skin of the legs or of the right arm caused a strong contraction in flexion. The clinical diagnosis was multiple sclerosis. The reflex is obtained by stimulation of the deeper parts as well as by stimulation of the skin but the author suggests the term "cutaneous reflex of defense" to distinguish it from that form of spastic paralysis which is accompanied by increased tendon reflexes.

2. *Neurological Complications of Acute Malaria.*—In a series of two hundred cases of acute malaria, the following cases with neurological symptoms appeared: A case of right hemiplegia with aphasia, autopsy showed a large sub-dural hemorrhage; a case of coma with alternate hemiplegia, syndrome of Weber, autopsy showed no gross lesion but an intense congestion especially in the region of the pons where there were masses of parasites and pigment; two cases with meningitic symptoms were cured in from twenty-four to forty-eight hours with quinin; one case of the syndrome of Landry, cured in a few days; one case of polyneuritis, rapidly cured with quinin; and five cases of the cerebral form of malaria with coma, of which two were fatal.

Carl D. Camp (Ann Arbor).

Review of Neurology and Psychiatry

(Vol. IX, No. 11)

1. The Sensory Phrenic and its Organs. Leonard J. Kidd.
2. The Use of Salvarsan in Mental Diseases. R. Dods Brown.

1. *The Sensory Phrenic and its Organs.*—The writer follows Piersol in describing the gross anatomy of the phrenic nerve. He states that further study of the histology is needed, as it appears to be unknown whether the phrenic contains any non-medullated fibers. Also, there is no detailed account to be found of development of the nerve. An excellent summary of the experimental researches leading to our present knowledge of the nerve is given. The discovery of the sensory fibers is attributed to Ferguson, in 1891, and confirmed by Sherrington in 1894, and by Sano in 1898. The exact ganglionic origin, course, and exact peripheral distribution of all the splanchnic afferent fibers of the phrenic are not known.

Does the right auricular branch of the right phrenic contain any afferent fibers? What is the ganglionic origin of the supra-renal fibers of the phrenic nerve?

Clinically, the phrenic is very important. The writer gives a good summary of various observations made since 1835. Among them may be mentioned Bouilland's work on pericarditis and cardiac neuralgias; de Mussy on diaphragmatic pleurisy in 1853; Peter's work on diaphragmatic neuralgia and phrenic neuralgia in 1871; the writer's case of puerperal shoulder pain of phrenic origin; various papers on supra-renal tumors. The writer collates the following conditions in which shoulder-tip pain has been noted: acute cholecystitis, appendicitis, carcinoma of the liver, carcinoma of the pancreas, ruptured duodenal ulcer; some cases of shoulder arthritis; some cases of nucho-acromio-brachial neuralgia and "neuritis"; sometimes in the initial stage of diaphragmatic tics, and also some shoulder muscle tics; rarely in tabes dorsalis; herpes of third to sixth cervical ganglia.

In regard to the question of visceral sensibility the writer considers that the viscera and serous membranes themselves are insensitive, but their extra-visceral connective tissues are sensitive; and when visceral disease causes pain it does so by involvement of nerves distributed to these connective tissues.

2. *Salvarsan in Mental Diseases.*—Seventeen cases of mental disease of a syphilitic, "parasyphilitic," and non-syphilitic nature were treated. The cases comprised one of syphilitic psychosis, five of general paralysis, five of dementia præcox, two of acute delirium, two of paranoia, one of "acute mania," and one of "acute melancholia." The effects obtained were those which might be expected. The cerebral syphilitic was benefited to a marked degree. The delirious cases were helped considerably; other paralytics but very little. Conditions of catatonia and hebephrenia seemed improved; subsequent recurrent attacks of excitement in the maniacal case were less severe. The writer is encouraged to make further use of salvarsan in mental disease.

C. E. Atwood (New York).

Archiv für Psychiatrie

(Band 49, Heft 3)

XXI. Contribution to the Pathological Anatomy of the Peripheral Nerves in Metasyphilitic Diseases. Gabriel Steiner.
XXII. Thieving in Dementia Præcox. Paul Kirchberg.
XXIII. A Contribution to the Study of Cysticercus of the Brain and Cord, Especially of Meningitis Cysticercosa. Kurt Goldstein.
XXIV. Neuroma. Sergius Michailow.
XXV. Contribution to the Pathological Anatomy of Microgyria. K. Melissinos.
XXVI. Pellagra. A. D. Kozowsky.
XXVII. The Etiology of Tabetic Arthropathy. K. Stargardt.

XXI. *Pathological Anatomy of Peripheral Nerves.*—Steiner draws the following conclusions from his study of the peripheral nerves in metasyphilitic disease: In the peripheral spinal nerves disturbance of the mesodermal tissue occurs similar to that seen in the corresponding structures in the central nervous system. There is no histological parallelism between the alterations of the mesodermal connective tissue and the nerve fiber. The peripheral lesion stands in relation to that of the central nervous system only in so far as they have a common cause. On the symptomatic side, there is no special significance to be attached to the lesions of the mesodermal supporting tissue.

XXII. *Thieving in Dementia Præcox.*—On the basis of seven cases, Kirchberg discusses the tendency to steal at times observed in dementia præcox. He insists therefore upon the importance, when such a symptom occurs in an otherwise unsuspected patient, of investigating carefully the physical condition as well as the mental state, in order to determine the possible existence of dementia præcox. The legal bearings of the situation are also evident.

XXIII. *Cysticercus of the Brain.*—Goldstein has collected five personal cases of cysticercus of the brain and cord. These he discusses at great length, both from the clinical and pathological standpoint. It is not possible in the space of this review to give in detail his findings either on the clinical side with reference to diagnosis, or on the pathological side with reference to changes in blood vessels and in the brain substance itself. The paper is a valuable contribution to a rare and clinically often unrecognized disease.

XXIV. *Neuroma.*—In this article Michailow criticizes with justice the use of the term *neuroma*. After a most painstaking examination of the literature, he reaches the conclusion that the term *neuroma* occupies a peculiar position in the nomenclature which should be rectified, or at least better understood. In his opinion, the term *neuroma* should be applied only to those growths which contain elements of nerve tissue, and not to tumors which happen to be located on nerves but may be myxomatous or sarcomatous in character.

XXV. *Microgyria.*—Mellissinos, after a succinct and useful reference to preceding papers, gives at length the clinical history and the pathological findings in a case of microgyria. The brain stem and spinal cord were examined microscopically, as well as the brain. Various conclusions are drawn from this study, which are useful from an anatomical as well as from a pathological standpoint.

XXVI. *Pellagra.*—In this number Kozowsky completes his exhaustive article on pellagra. This may well serve as a complete statement of our knowledge of this disease up to the present time. After a careful analysis of the affection from every possible standpoint, the definite conclusion is reached that even clinically the disease is not to be regarded as a symptom complex, but as an independent disease; or as stated in his own words: "Pellagra is both from an anatomical and clinical standpoint a typical chronic disease which may be differentiated during life as well as after death from other diseases."

XXVII. *Tabetic Arthropathy.*—A study of the etiology of tabetic arthropathy leads Stargardt to the conclusion that a very special form of syphilitic tissue disease leads to the arthropathies as well as to the spontaneous fractures observed in tabes. He again suggests the possibility proposed by Lesser to name such processes which occur in the very late periods of syphilis as *quartäre prozesse*, which might be translated as "quartuary" processes. Stargardt is at least convinced that no importance is to be attached to gummatous processes in the development of fractures and diseases of the joints.

E. W. Taylor (Boston).

Monatsschrift für Psychiatrie und Neurologie

(Vol. 31, No. 2. February, 1912)

1. The Question of the Sensibility Paths in the Human Spinal Cord. H. Fabritius.
2. Tabes in Women. K. Mendel and E. Tobias.
3. Carcinoma Metastases in the Cerebellum. P. Girardi.
4. Head Measurements in Congenital and Developed Mental Disorders. H. Krueger.

1. *Sensory Paths.*—A continued article, to be reviewed at its conclusion.

2. *Tabes in Women.*—Upon a basis of a material of about forty cases of tabes in women the authors have compiled a sort of monograph on the subject, comprising an historical review and chapters on relation to syphilis, incubation period, other etiological factors, symptomatology, complications, diagnosis, pathological anatomy, comparison with tabes in men, course, prognosis and treatment. It is a reliable treatise evolved from careful observation in a relatively large number of cases. In the experience of the authors tabes runs a much milder course in women and is very apt to become stationary. Therapy offers little hope except prophylaxis. "The best prophylaxis of tabes in women is thorough treatment of syphilis in men."

3. *Metastases.*—A case of a carcinoma metastasis in the cerebellum is reported. It is known that cases have presented marked symptoms of metastatic growths in the brain and been diagnosed such, only to be found at autopsy to show no such growth or a very small one, perhaps situated at a distance from the locality referred to by the symptoms. These facts suggest the possibility of the symptoms being produced by toxins elaborated by the tumor. From the histological findings in his own case the author does not come to a definite conclusion whether the changes in the neighborhood of the neoplasm were due to pressure or to toxic influence, but believes the latter much more probable. The Purkinje cells in the immediate neighborhood of the growth showed a central chromatolysis—an alteration which is not seen as a result either of pressure or intoxication but follows destruction of the axis-cylinder.

4. *Head Measurements.*—The horizontal and sagittal diameter and circumference, the auriculo-temporal line and the other common measurements used in craniometry are greatly affected by birth-accidents, race-peculiarities, rickets, etc. Moreover the fixed points from which these measurements are made are variable and often hard to find. Kellner has shown that the height of the skull is the best measurement of general intelligence. But the vertical line over the ears is apt to be affected by great breadth due to rickets. The author has therefore adopted an auriculo-frontal line, between the anterior borders of the external auditory meatus over the frontal eminences. This indicates the height of the skull in that region which, being the seat of intellectual and emotional life, should be definitely lower in congenital imbecility, the pathologic-anatomical basis of which is a loss of cells and fibers especially in the frontal region. The author's measurements were made upon 431 men and 315 women among which all the psychoses were represented and there were a number of feeble-minded (not idiots). The average measurements for imbeciles is compared with that of all other psychoses combined. Tables are given showing that horizontal and other measurements are of little value. The auriculo-frontal line, however, showed a significant dif-

ference in average between imbecility and other psychoses. Moreover, in other psychoses where inherited stigmata were obvious, this line was also shorter than average. The author believes this measurement will be valuable in doubtful cases in throwing the balance toward congenital or toward developed disorders.

(Vol. 31, No. 3. March, 1912)

1. Thomsen's Disease and Muscular Atrophy. O. Ascenzi.
2. The Grouping of Speech Associations. Pfersdorff.
3. The Pathophysiological Conception of the Seizures and Deliria in Progressive Paralysis. H. Schrottenbach.
4. Functional Interference in the Train of Ideas in Organic Brain Disease (Tumor). O. Sittig.
5. The Question of the Sensibility Paths in the Human Spinal Cord. H. Fabritius.

1. *Thomsen's Disease.*—In view of the frequent observation of well-defined symptoms of myotonia in other nervous diseases, especially functional disorders, the author believes the name Thomsen's disease should be applied to the congenital myotonias and that these cases should be differentiated from acquired myotonic states associated with other affections. The author describes a case of myotonia associated with muscular atrophy —an "atrophic myotonia." A number of ergograms accompany the text. It is probable that the two conditions are dependent upon the same pathological process. Whether this is purely an alteration in the muscles, or whether it is neuro-muscular, is still in doubt. Thirty-one cases similar to the author's are summarized from the literature. Certain peculiarities in the nature of the muscular contractions are described in detail.

2. *Speech-associations.*—A continued article, to be reviewed at its conclusion.

3. *Attacks in Paresis.*—Leucocyte estimation was made in ten cases. Leucocytosis occurred in every paretic attack. It was higher in the apoplectic than in the epileptic type. In acute delirious states the count was lower but in protracted deliria as high as in epileptic attacks. The leucocyte count usually varied with exacerbations and remissions in the symptom-picture. These facts speak for a toxic origin of the attacks.

4. *Train of Ideas in Organic Brain Disease.*—The case in question showed at autopsy a large endothelioma involving the left frontal lobe, island and first temporal. Typical signs of brain-tumor had not been present but there was weakness of right limbs and face. No articulatory disorder was present at any time. The mental state was one of dullness and amnesia with extreme retention-defect. There was no aphasic disorder, no spontaneous talk. Systematic questioning revealed the fact that extensive linking together of associations was quite impossible. Given appropriate words he was able to give their principal characteristics in terms of all the senses, as sugar—sweet, coin—round, etc., but when the characteristics of an article were given, as "it is white, flat and one writes on it," he was unable to name it. A concept could be easily brought up but the linking together with other concepts failed. The condition is likened to a loss of what James has called "overtones" in psychological processes. The ground-tones were awakened without difficulty but the overtones which, in the normal mind, connect concepts together in a train of associations were interfered with by the organic process. The condition is

rare and hitherto regarded as more probably of hysterical nature. In this case the organic cause was obvious.

5. *Sensory Pathways.*—A continued article, to be reviewed at its conclusion.

J. W. MOORE (Central Islip).

Zeitschrift für die gesammte Neurologie und Psychiatrie

(Volume V)

1. The Coöperation of the Psychiatrist in the Care and Training of the Young. SCHNITZER.
2. Rare Trophic Neurosis. SIMONS.
3. The Clinical Significance of Plaques. SCHROEDER.
4. Family Psychosis. FRANKENHAUSER.
5. The Theory of Hysteria. MEYER.
6. Cytology in Cerebro-spinal Fluid. KAFKA.
7. Ergot Psychosis. .GUREWITSCH.
8. The Technique of Injection of Salt Solution in Sciatica. SCHEPELMANN.
9. Contribution to Localization of Apraxia. STAUFFENBERG.
10. The Conception of Hysteria. GAUPP.
11. History of Progressive Paralysis. MOENKEMOELLER.
12. Malignant Chordoma Involving Brain and Spinal Cord. JELLIFFE and LARKIN.
13. Contributions to the Study of Pathology of the Spinal Cord. OPPENHEIM.
14. Hysterical Fever. KAUFFMANN.

1. *The Coöperation of the Psychiatrist in the Care and Training of the Young.*—Schnitzer offers a very interesting article on this subject, which would repay one to read in the original. He maintains that 50 per cent. of the young that require institutional care are mentally 'defective. The abnormal personality is the most striking cause for their criminal tendencies, etc. It is important that such pupils should receive the attention of the psychiatrist and be treated accordingly. The markedly defective cases should be placed in a psychiatric institution; the mild cases should be segregated from the normal ones; and those cases which could be cared for by families should be under observation of a commission, one member of which should be a psychiatrist. In other words, the author insists that such cases should be attended by competent psychiatrists. Indeed, Schnitzer's argument is worthy of our support; after all a pedagog without medical and psychiatrical training is unable to bestow proper attention and care upon these unfortunate members of the community.

2. *Rare Trophic Neurosis.*—Simon reports a case of trophic neurosis which he considers to be "Lipo-dystrophia progressiva."

3. *The Clinical Significance of Plaques in the Brain.*—The author, from his investigations, agrees with Fisher and Alzheimer that typical tissue changes may be found in the gray substance of senile and presenile brains. He supports Fisher's view that the anatomical findings are characteristic of senile dementia, but confirms Alzheimer's conclusions that the plaques are not the cause but accompanying manifestations of senile involution. The writer has little to offer as to the origin and significance of the plaques. He sees no objection of regarding them as products of abnormal metabolism or cell degeneration, because they are usually found in the cortex and nerves of the medullary substance.

4. *Family Psychoses.*—Frankenhauser contributes to the study of heredity in mental diseases. His paper deals with the occurrence of psychoses in children of the same parents. He emphasizes the fact that paternal vesanic taint plays an important rôle in psychoses. He analyzed forty families which comprised 87 members. The results of his analysis may be given as follows: 87 cases of insanity; 17 families insanity in both sexes; 19 families insanity in females only; 4 families insanity in the males only; 7 families, three members of each family insane; 2 families, six males insane; 5 families, 15 females insane; 9 families insanity began first in a male member; 8 families insanity began first in the female member.

5. *The Theory of Hysteria.*—Meyer's article on the theory of hysteria is rather dogmatic, and indeed fails to embrace all the phases of this interesting problem. It is important to note that the author devotes only a short paragraph to Freud's conception of hysteria, nevertheless has the courage to remark that the Freudian efforts to reveal the psychopathology of hysteria were futile. One might as well write a thesis on the circulation of the blood and say nothing of Harvey. Meyer maintains that suggestion alone is not sufficient to determine physical disturbances in hysteria. However he maintains that dynamic disturbances in cerebral activity must primarily influence the nature of the association process. It is a well known fact that the conscious and unconscious dissociated complexes are determined by emotional factors. The somatic symptoms are caused by the anchoring of affective processes to the association complexes and, indeed, this is the characteristic of the independent fixation of hysterical products. The accompanying physical manifestations of affect is the main factor in hysteria. An affect will guide attention or control the dynamic forces of cerebral activity. The foundation of hysteria is simply the hysterical lability and the disease extends to the normal processes of the rest of the brain. In a train wreck a marked affect may determine an hysterical attack in any person. In regard to therapy the author maintains that suggestion alone is not sufficient but it should be remembered that since all mental products originate from real experiences, the therapeutic treatment should be directed along such lines.

6. *Cytology of the Cerebro-spinal Fluid.*—Kafka comes to the following conclusions. (1) Since the cells of the luetic and meta luetic diseases of the meninges undergo disintegration and alteration it is necessary to add formalin immediately upon the withdrawal of the fluid. (2) Under such conditions the cells do not undergo immediate disintegration. In some cases the cells may dissolve, in other instances one could follow the various stages of cell disintegration. (3) The plasma cells disintegrate first, then polynuclear leucocytes and lastly the lymphocytes. (4) The alteration of cells occurs in all forms of mental diseases, and is independent of activation or inactivation. It is interesting to note that on addition of complement similar changes are observed. (5) The white cells which appear in the fluid of acute purulent meningitis are like those in the blood; they react differently in various fluids. (6) He is forced to conclude that disintegration of the cell is not dependent on the fluid but is rather due to the cell itself. The cell bodies of the cells appear to be so labile that under various circumstances they even disintegrate extra corpus.

7. *Ergot Psychosis.*—Gurewitsch reported eighteen cases of ergot psychoses, and reached the following conclusion: The mental picture is characterized by disturbances of consciousnesses. Twilight of consciousness

which is a constant manifestation at the height of the disease, is most frequently associated with epileptiform attacks. Amnesia is invariably present. Reduction of attention and retention disorder are common. Hallucinations and delusions may occur: The mood varies, in some cases depression and in others exaltation was the prevailing symptom. The course is commonly characterized by remissions and exacerbations with sudden transitions from one state to another. Most of his cases recovered in three months. There are no somatic manifestations that characterize the disease picture, except convulsive seizures were commonly seen in all cases. Reflexes may show some variability, trophic and sensory disturbance were at times observed.

8. *The Technique of Injection of Salt Solution in Sciatica.*—The author recommends the injection of 150 c.c. of normal physiological salt solution for sciatica. He emphasizes the fact that the solution should be injected directly into the nerve sheath. By so doing, unpleasant effects such as pain and injuries to blood vessels would be avoided. Schepelmann invented a special needle, which he described in detail in this article.

9. *Contribution to Localization of Apraxia.*—Stauffenberg reports a case of a woman 71 years of age who suffered a stroke; following which she showed evidence of sensory aphasia and unmistakable motor apraxia. She had another stroke following which hemianopsia was noted. She died and autopsy showed cerebral arteriosclerosis with some areas of softening in the right occipital region. The lesion in the gyrus supramarginalis will explain the symptoms of apraxia. And indeed his case is similar to those described by Stroheimer, Kryukow and Iwanoa. The author's case is a rather interesting casuistic contribution to the study of apraxia.

10. *The Conception of Hysteria.*—Gaupp discusses the question of hysteria and his views may be summed up as follows: The nature of the hysterical reaction is an expression of a congenital disharmony. It is possible that the mental structure may show other defects which resemble more or less the hysterical character. The more these characteristics become accentuated during life the less it is possible to eradicate them. An individual without an hysterical temperament, under certain great emotional stress, may find refuge in the disease but most probably would not develop an hysterical character.

11. *History of Progressive Paralysis.*—Moenkemoeller has made a painstaking study of the history of general paralysis and presents valuable documentary evidence, proving the existence of paresis long before it had been known to the medical profession. Formerly paresis was rare but in the latter part of the eighteenth and beginning of the nineteenth century, it grew more and more in frequency.

12. *Malignant Chordoma Involving Brain and Spinal Cord.*—The authors gave an exhaustive review of this article in the first number of this journal in 1912.

13. *Contribution to the Study of the Pathology of the Spinal Cord.*—Oppenheim gives a very instructive paper on the pathology of the spinal cord and reports several interesting cases; some of which were with operation and others with operation and autopsy. The author maintains that in those cases which show no gross appearances of a tumor, a small piece of the cord should be excised and a very careful microscopical examination should be made. He refers to instances in which operation and autopsy gave negative results regarding neoplasm, yet the meninges revealed striking pathological alterations. The article is extremely in-

teresting and one who is engaged in the study of the pathology of the spinal cord would find it worthy of careful perusal.

14. *Hysterical Fever.*—Kaufmann reports a case of hysteria with fever. It is rather important to note that the case was poorly recorded and it is hardly conceivable how one could offer such conclusions on the strength of one instance. His conclusions are (11) that in pure functional brain diseases and hysteria fever, in consequence of heat disturbance, may result; (2) that water output can show marked variation which may depend upon the central disturbance of renal activity and innervation disorder of musculature; (3) like in mental diseases the temporary difference between vegetative and psychical processes may exist, which could be explained on organic basis. ***Fewer suppositions and more well observed and studied cases would be more welcome.***

KARPAS and CONZELMANN.

Journal of Mental Science

(Vol. 54, 225. April)

1. The Symptoms and Etiology of Mania. LEWIS C. BRUCE.
2. Amentia and Dementia; a Clinico-Pathological Study. JOSEPH SHAW BOLTON.
3. Recidivism regarded from the Environmental and Psycho-Pathological Standpoints. J. F. SUTHERLAND.
4. The Unity of Insanity and its Bearing on Classification. THOMAS DRAPES.
5. Clinical Results following the Injection of Tuberculin. C. J. SHAW.
6. Of the Onset of Melancholia. R. R. LEEPER.
7. Statistical Notes on Criminal Lunacy in the Punjab Asylum. C. J. ROBERTSON-MILNE.

1. *Symptoms and Etiology of Mania.*—This series of three Morrison lectures presents arguments for the theory that acute mania is a bacterial disease, probably of streptococcus origin. The author believes in a "hereditary predisposition, meaning an unstable nervous system," with the exciting causes being bacterial toxins. The evidence of the latter is: (1) The presence of an agglutin in the blood of patients suffering from mania, which is similar to an agglutin obtained from rabbits infected with streptococcus and staphylococcus; (2) leucocytes found in maniacal patients; (3) intestinal disorders of a toxic nature. Changed bacteriological flora of alimentary canal; (4) increased excretion of nitrogen by the urine in excess of urea nitrogen food value ingested. The work is illustrated by a large number of explanatory charts. The laboratory procedures upon which the unusual conclusions are based, are described in minute detail.

2. *Amentia and Dementia.*—Continued article.

3. *Recidivism.*—Continued article.

4. *Unity of Insanity.*—The author calls attention to the fact it is well recognized that a satisfactory definition of insanity does not exist. But some form of classification is necessary as a working basis if there is to be made any advance in the knowledge of the subject. He feels that the English have been wise in not adopting this perhaps more scientific classification, which is often, he says, more of a hindrance than a help. He argues that insanity is more or less of a unity which manifests itself externally in various and manifold symptoms. Even general paralysis,

with its pathology and quite definite termination, may be characterized at different times by varied symptoms. The writer, as many others, fails to grasp what is meant by the terms manic depressive insanity and dementia præcox. He considers the former, *i. e.*, manic depressive insanity are "those which constitute a large proportion of ordinary chronic insanity." At the close of the article a scheme of classification is proposed, which is not easily abstracted, and is of more local interest.

5. *Injection of Tuberculin.*—Observations were made on normal control cases and insane cases after the injection of 1/500 mgr. T. R. and 1/750 mgr. T. R. There was no marked change in temperature and pulse. Following the injection there is leucocytosis, the maximum of which is not reached in the insane as soon as in the sane. No definite conclusions could be drawn from a study of the urinary excretion of urea before and after the injection of tuberculin. No change in the mental state of any patients was noticed after injection with 1/750 mgr. T. R. After injection with 1/500 mgr. T. R. some excited cases showed temporary aggravation of the symptoms, and some cases of depression showed apparent improvement for a few days. This change was only temporary.

6. *Onset of Melancholia.*—The common theory of the causation of melancholia is based upon the idea of auto-intoxication, but no toxin has yet been discovered. There is apt to be a neurotic or insane heredity as a predisposing cause, coupled with physical debility, with sudden grief, mental shock, poverty, etc., as exciting causes. A case is cited in which recurrent attacks of depression were accompanied by increased blood pressure. Several other cases are given in abstract.

7. *Criminal Lunacy in the Punjab Asylum.*—A statistical study of the criminal insane in India. An interesting observation is the fact that the majority of the insane population are kept in their village homes by their friends, and it is only when they have committed crimes, are homeless, or are a danger to the public, that they are confined in an asylum.

W. C. Sandy (Trenton).

(Vol. 54, 226. July).

1. Amentia and Dementia: a Clinico-Pathological Study. Joseph Shaw Bolton.
2. A Philosophy of Psychiatry. Bernard Hart.
3. The Mental Recreations of the Mental Nurse. Robert Jones.
4. Observations on the Less Severe Forms, Pathology and Treatment of Mental Disorder in Advanced Life. Alexander Robertson.
5. Dementia Præcox and Mental Degeneracy in Syria. H. Thwaites.
6. Observations on Insane Epileptics Treated under Hospital Principles. Leonard D. H. Baugh.
7. Some Observations on Insanity in Jews. Harvey Baird.
8. The Boarding Out of the Insane in Private Dwellings. Cunnyngham Brown.
9. The Teaching of Psychiatry. D. G. Thomson.
10. Some Points in the Histology of Lymphogenous and Hæmatogenous Toxic Lesions of the Spinal Cord. David Orr.

1. *Amentia and Dementia.*—Continued article.

2. *A Philosophy of Psychiatry.*—A somewhat involved and confusing philosophical discussion of the question of psychiatry. The great differ-

ence between the physiological and psychological conceptions of mental diseases is discussed at length, with the result that the author claims that they should be separate and distinct lines of research, and should not overlap. They must be allowed to proceed along their respective roads. Much space is given to the discussion of the relation of mental and physical factors. The causation of mental diseases by physical factors is rather obtusely discussed, such as the following remark: "Now, if we say that a toxin causes mental confusion, we are using the concept of causality in its first or empirical and not in its second or ideal form." And he cannot conceive of a mental state "as a continuation of the collection of atoms termed a toxin." The question of classification is also given some consideration, and on the whole the author has given much on the subject that is of value. The loose clinical descriptions so common in England, and some years ago in this country, are deplored by the writer. For example, he shows the utter inability for one to contrast a mental picture of the disease, "mania," as that term was used some years ago. Contrast this with "catatonia," which term to every one conveys a certain definite symptom, whether we label the symptoms merely a complex or a separate disease entity. He approves of Kraepelin's longitudinal method of classifying diseases, but points out the disadvantages among which is the tendency to make the patient fit the disease. The advantages of his classification is to be found in the importance assigned to prognosis and therapeutics. The evolutionary method, whereby an honest endeavor is made to trace the development of a mental state from that which preceded it, and to correlate the various symptoms is also approved. This is the modern trend of psychiatry and through "psychanalysis," great strides have been recently made in the study of the symptomatology of mental diseases. Thus, "a delusion will no longer be regarded as suddenly coming into existence without rhyme or reason,.but its origin from the preceding mental state will be definitely traced out." A just appreciation of the advantage of this method over the old method of case description so much in vogue in some localities in that delusions, hallucinations and bad tempers are aimlessly catalogued without reference to each other or to the patients. The author concludes with a brief mention of the value of psycho-therapeutics.

3. *Recreations of the Mental Nurse.*—An address delivered before the Asylum Workers' Association, which emphasizes the need of mental as well as physical diversion for the asylum nurse. The work is confining, the training school requirements exacting, and the life in general full of worry and anxieties. Among the suggestions, are gardening, reading good books, music, art and religion.

4. *Less Severe Forms, Pathology and Treatment of Mental Disorders in Advanced Life.*—A discussion of cases occurring in the Glasgow Old People's Home. Several cases of maniacal excitement and others with hallucinations and delusions are given in abstract. The former, *i. e.*, the maniacal attacks, are commonly of short duration and mild in character. The latter are more persistent, rarely ever totally disappearing, sometimes having a temporary subsidence.

5. *Dementia Præcox and Mental Degeneracy in Syria.*—The author calls attention to the fact that dementia præcox comprises 27 per cent. of the admission at the Lebanon Hospital. He endeavors to account for this by a predisposing mental degeneracy of the race which is due to (1) the peculiar indifferent fatalistic racial attitude, and (2) to the effect on the

people of long-continued subjection to foreign rule. Both of these causes have brought about a condition corresponding to the diagnostic symptom of dementia præcox as stated by Kraepelin, *i. e.*, "the peculiar and fundamental want of any strong feeling of life's impressions."

6. *Observations on Insane Epileptics Treated under Hospital Principles.*—Initial treatment by rest in bed in an admission ward is advocated by the writer, corresponding to the generally accepted idea of treatment of the insane on hospital lines. This treatment is continued for some time, perhaps eventually the patients being kept in bed out of doors. The diet is carefully arranged. No sedative drugs are used at first. Free purgation is advocated. Some of the advantages gained from the hospital method are: The benefits of individual attention; the attainment of a nearer approach to a physical standard of health; the preservation of alertness of mentation; the graver manifestations of the disease itself are lessened; mental recovery, where possible, is promoted and facilitated; the colony system will accomplish still more if combined with the principles of hospital treatment; a number of tables are provided and the important features discussed in detail.

7. *Insanity in Jews.*—The paper is based on the statistics of the London Asylums. The author's own conclusions are as follows: (1) The insane London Jewish population is doubling itself every ten years; (2) the average admission age of the Jew is six and a half years less than that of the non-Jew; (3) alcoholic excess is three times as frequently an assigned cause in the non-Jew as in the Jew; (4) insanity associated with childbearing is relatively more than twice as common in Jewesses; (5) general paralysis is rather less common; (6) the foreign Jewish inmate is relatively more troublesome; (7) the prognosis of the cases admitted is not as good in the Jew.

8. *Boarding Out.*—The present day overcrowded condition of asylums with the accumulation of the chronic and incurable lessens the chance for individual treatment and recovery. The system of boarding out as practised in Scotland, France, Holland and Germany, gives a decided relief to congested institutions, and is in itself a valuable therapeutic aid. The author discusses the various systems, cost, etc., in the different localities and concludes that there are a number of favorable features: (1) the patients are happier; (2) their physical condition is better; (3) it affords a satisfactory means of testing for discharge; (4) as a rule, the expense is less per patient.

9. *The Teaching of Psychiatry.*—This paper emphasizes the need for either mental wards in general hospitals or special mental hospitals for early acute cases in the great cities. The advantages of such provisions would be obvious for the patient and would also afford centers for research and post-graduate instruction in mental diseases.

10. *Histology of Lymphogenous and Hæmatogenous Toxic Lesions of the Spinal Cord.*—The authors placed a celloidin capsule filled with a broth culture of an organism under the sciatic nerve or under the skin of the cheek of a rabbit. There resulted a degeneration in the spinal cord or brain according to the situation of the capsule resembling the early stages of tabes dorsalis and general paralysis. They concluded "that these two diseases, if toxic, were probably infections of lymphogenous origin." But the brain and spinal cord may be infected by the circulation of toxins in the blood. The authors' research, as yet incomplete, justifies them in stating that there is a difference in the anatomical

distribution, suggesting that "system lesions such as tabes and paresis fall into the lymphogenous group, while those found in acute insanity, leukemia, pernicious anemia, Addison's disease, metallic poisoning and other forms of general intoxication fall into the hematogenous group."

W. C. SANDY (Kings Park, N. Y.).

Allgemeine Zeitschrift für Psychiatrie

(Vol. 69. 1912. Heft. 2)

1. Liberation from Asylums. MONKMÖLLER.
2. Wound to Brain in Epileptic Attack. FR. SIOLI.
3. Examination of Soldiers in Military Prisons. WEGERT.
4. Tests for Perception, Comprehension, Memory and Distractibility. E. BISCHOFF.

1. *The Liberation of Patients from Insane Asylums.*—In nearly all countries, the liberation of a prisoner, by anyone employed in his safe-keeping, is an offence punishable by imprisonment. The author discusses the status of attendants or other employees of asylums who assist patients to escape, or allow them to do so through criminal negligence. He shows that through the tendency of the legal profession to look at lunatics not as prisoners but as occupying the same general position as ordinary sick people in hospitals, the outcome of legal processes instituted with a view of punishing such neglect of duty on the part of attendants depends very much upon the personal views of the judge and conviction is often impossible. A reform of the existing German statutes relating to responsibility for the safe-keeping—especially of dangerous and criminal lunatics—he thinks imperative if discipline is to be maintained in institutions and the protection of the public is to be assured.

2. *A Case of Wound to the Brain in an Epileptic Attack.*—Upon making an autopsy upon a 27 year old epileptic, the author encountered an unusual resistance in getting out the brain and found a narrow piece of wood about 5 cm. long protruding from the tip of the right temporal lobe. This proved to be the end of a pen holder which the patient had had in his hand upon the occasion of a fit over a year before, at which time she was supposed to have sustained through a fall a fracture of the skull with concussion of the brain having shown the symptoms of vomiting, headache and vertigo, with later an effusion of blood into the right orbit. After recovery from the initial symptoms the foreign body gave no sign, and its presence greatly surprised those making the autopsy. It had penetrated to the brain through the orbit.

3. *Examination of Soldiers in a Military Prison who had Formerly been Inmates of Juvenile Correctional Institutions.*—The author reports on 29 cases examined by him, exposing such facts as he was able to obtain with regard to heredity, family relations, physical condition as children, reasons for commitment to the correctional institution and career in the latter as well as about the military record. As a rule he could get no accurate record of any psychological examination from the institution authorities, only a general opinion, and it is noteworthy that 14 of his subjects had been deemed incapable of being rendered to any extent useful individuals. Naturally the majority of these men proved to be worthless as soldiers, impatient of discipline, prone to desert, when not criminal otherwise. Of the 29, 14 were imbeciles of higher or lower

grade, 10 were psychopaths—3 of these having epileptoid attacks—one was a precocious dement, while the remaining four were difficult to classify exactly.

4. *A Simple Clinical Psychological Method of Testing Perception, Comprehension, Memory and Distractibility.*—In the method published by Vieregge in this JOURNAL, Volume LXV, a row of figures from 1 to 20 places are called off to the person being tested and he is asked to repeat them in proper order, at once, after an interval of one minute his attention having been kept upon the task in the interim, and after one minute his attention having been purposely relaxed. The author found that for practical use it was not necessary to use rows of over ten places; of ten persons chosen for the experiment, not one being able to reproduce at once any one of a row of eleven figures and only one of the ten giving correctly even one of ten rows of ten figures each. Further investigation showed that it made considerable difference whether the rows of the higher number of figures were given first or whether a start was made with the simpler rows, the variation between greatest and least numbers of correct answers being less in the first instance. By another set of experiments it was found that immediate reproduction by no means gave the highest number of correct results at least when the Kraepelin-Finzi method with letters was used in periods graded from immediately to 60 seconds, that of 15 seconds proving the optimum. In further experiments intended to prove whether spoken numbers, or the exposition of printed numerals were better adapted for stimuli, it was found that while the ability to reproduce varied within greater limits when the numerals were used, the method of spoken numbers gave the more exact results.

C. L. ALLEN (Los Angeles).

L'Encéphale

(Sixth year, No. 4. April, 1911)

1. A case of Tuberous Sclerosis. L. BABONNEU.
2. Deliria of Imagination. DUPRÉ AND LOGRE.
3. Choreic Syndrome and Intradural Tumors in an Alcoholic. LUCIEN LIBERT.
4. Anatomical Drawings and Conceptions of a Patient with Dementia Præcox. PASTUREL.

1. *Tuberous Sclerosis.*—This is a rare disease of which little has been written. The author reports a case which was under his observation at Bicêtre for nearly three years from his fifth year until his death. He was described as "child affected with a turbulent idiocy accompanied by convulsive attacks and unable to speak." In fact during life there was nothing to differentiate his case from the other encephalites. The case is very minutely gone into. At the autopsy three tuberosities were found at the level of the paracentral lobes. A careful examination of the histological structure of these was made, the findings being too detailed to permit of an abstract.

The rest of the article is devoted to a review of cases hitherto reported of this disease and a discussion of its diagnosis and etiology. The conclusion is that in our present state of knowledge it is impossible to recognize this condition during the life of the patient and that no satisfactory hypothesis as to its etiology has yet been advanced. The article is well documented and illustrated by a number of excellent plates, some of them in color.

2. *Deliria of Imagination.*—In contradistinction to the hallucinatory deliria in which the disturbance is preponderatingly one of perception, and the deliria of interpretation in which perception is intact but the interpretation of relationships is impaired, in the deliria of imagination the patient equally careless of the observation by his senses and logical demonstrations makes affirmations the reality of which, although beyond all experience and totally unreasonable, he immediately believes.

The major part of this long article consists of a record and an analysis of a case of a young woman who after a very spectacular career of swindling and deceit came into conflict with the police. She was finally committed to Vancluse, being held as legally irresponsible. The rest of the article is largely an argument in favor of the recognition of this type of mental deviate as a fit subject for restraint and legal recognition of his irresponsibility.

3. *Choreic Syndrome.*—A long report and analysis of a case in which two small tumors were found in the dura of the frontal region to which, although there was a family history of choreic movements and a personal history of alcoholism, the author attributes the choreic symptoms exhibited by the patient.

4. *Anatomical Drawings.*—A short account of the notions of a patient suffering from dementia præcox concerning anatomy illustrated by some drawings showing his naïve conceptions.

C. W. Herring.

Miscellany

Indican Superstitions. A. W. Peters. (Training School, Feb., 1913.)

In an interesting bio-chemical review devoted to indicanuria, the author shows that most of the present methods of testing for indican are faulty, and that the interpretations are fallacious. All urines contain indican. To interpret an excess of indican as pathological, apart from a knowledge of the exercise done, physical and mental, and particularly of the diet, is an absurdity. Baa, in his recent important monograph on indicanuria, has stated that the indican test of intestinal intoxication is a superstition. The lacto-bacillin, milk cereal diet, etc., etc., chiefly of Metschkinoff's suggestions have no effect upon the production or excretion of indican. Auto-intoxication from the intestines is another medical myth, invented to hide the ignorance of man in the face of the mysterious.

Book Reviews

THE CLASSICAL PSYCHOLOGISTS. Compiled by Benjamin Rand, Ph.D. Houghton Mifflin and Co. $3.50 post paid.

This is a kind of book which is well worth while. It consists of a series of selections illustrating psychology from Anaxagoras to Wundt. It is not this or that author's opinion, it is the original stuff presented in a recognizedly best translation. There are forty-five authors taken up and much judgment has been displayed in selecting the material which best gives the authors' psychological views. Thirteen appear for the first time in any English translation: Of the ancient period, Anaxagoras, Empedocles, Democritus, Protagoras, Socrates, Plato, Aristotle, Zeno, Epicurus, Lucretuis and Plotinius are given; patristic and medieval are Tertullius, Gregory, St. Augustine, Aquinas, while for moderns we have Hobbes, Descartes, Spinoza, Leibnitz, Wolff, Loche, Berkeley, Hume, Hartley, Bennet, Condillac, Reid, Brown, Herbart, Beneke, Drobisch, Biran, Mill, Bain, Spencer, Mueller, Lotze, Weber, Fechner, Helmholz, Herring, March, Stumpf, James, Lange and Wundt.

This is all packed in 730 pages, a veritable vade mecum of the chief works of the psychologists of all times. For a physician such a work is invaluable.

DISEASES OF THE NERVOUS SYSTEM. By Judson S. Bury, M.D., senior physician to the Manchester Royal Infirmary. University Press, Manchester. 15 sh.

This is a clinical neurology of some nearly 800 pages, with a short anatomical introduction, a clinical manifestation and the rest devoted to nervous diseases.

The author first discusses disorders of the primary motor neurons, in which he groups hemiplegia, spastic diplegia, spastic paraplegia, and multiple sclerosis. Flaccid and atrophic palsies follow in which nerve palsies are first taken up, then the nuclear cord and bulbar palsies. Then follows a section of spinal disorders characterized by the presence of pain. Tabes is here described. Other sections follow with the same general type of grouping, which is mostly monosymptomatic.

The work is an excellent short text book. Reliable in its statements and fairly abreast of the work going on in this special field.

LEAD POISONING AND HEAD ABSORPTION. By Thomas M. Legge and Kenneth W. Goadby. Longmans, Green & Co., New York. $3.50.

The International Medical Monographs has this volume on the symptoms, pathology and prevention of lead poisoning, together with a description of the industrial origin, and an account of the principal processes involving risk.

It is a monograph in the best sense, giving in its 300 pages a readable, succinct and authoritative summary of the general lead situation.

RECOLLECTIONS OF FORTY YEARS. By L. Forbes Winslow. Chicago Book Co., Chicago, Ill.

The author has here presented a rambling gossipy sort of a book much taken with himself and containing little but newspaper psychiatry. It contains much to amuse and many settings of famous cases, mostly given in the journalistic style.

SADISMUS AND MASOCHISMUS. Von Dr. A. Eulenburg. Zweite Auflage. J. F. Bergmann, Wiesbaden.

The second edition of this work differs in but few particulars from the first. It contains a description of these psychosexual abnormalities, a discussion of the psychological and physiological roots of the impulses, and a more or less hasty summary of the anthropological evidences.

The lives of Sade and Sacher-Masoch are given, and then follow the special symptoms observed in the better recognized phases of the situation. The whole forms an amplified chapter of the same type as Krafft-Ebing's works on similar lines.

The work is short, 100 pages, well written, mostly purely descriptive and lacking in any insight as to the genetic psychology of the types under discussion.

UEBER DIE PATHOLOGIE DER EIFERSUCHT. Von Dr. M. Friedmann. J. F. Bergmann, Wiesbaden.

The latest addition to Loewenfeld's Grenzfragen series is this short and ingenious monograph. Friedmann has given some excellent studies on delusional development and paranoid ways of thinking and the present short discussion shows a similar grasp of clinical situations, even if we feel we lack a firm dynamic interpretation.

He discusses jealousy from both the nutritive and the sexual standpoints and also takes up pathological types. It is an interesting and suggestive study.

DIE ERKENNUNG DER PSYCHOPATHISCHEN KONSTITUTION. Von Prof. Dr. H. Ziehen. S. Karger. Berlin.

Ziehen's concept of the psychopathic constitution is here set forth in a short and practical summary of only 34 pages. It bears especially upon psychopathic children and their care and is a well written, clear and able presentation of the problem.

CHARLES BELL. Idee einer neuen Hirnanatomie. 1811. Original Text und Uebersetzung. Mit Einleitung herausgegeben, von Dr. med. Erich Ebstein. Leipzig, Johann Ambrosius Barth. Mk. 1.50.

The Klassiker der Medizin consists of an interesting series of medical classics which are being printed by J. A. Barth. Bell's Idea of a New Anatomy is one of the recent (No. 13) volumes of the series. It is given in English and in German.

LA MÉNÍNGITE CÉRÉBRO-SPINALE. Par Arnold Netter et Robert Debrè. Masson et Cie, Paris. 8 Francs.

In a singularly clear and masterly manner the authors have discussed the chief problems connected with this almost universally distributed disease. Although American literature is particularly rich in this domain this is a welcome addition to the consideration of this disease.

Notes and News

PRELIMINARY PROGRAM OF THE MEETING OF THE AMERICAN NEUROLOGICAL ASSOCIATION, TO BE HELD IN WASHINGTON, MAY 5, 6 AND 7, 1913.

"The Early Perimetric Deviations Accompanying Pituitary Lesions," by Dr. Harvey Cushing. "Convulsions, their Interpretation from a Pathological Standpoint," by Dr. T. H. Weisenburg. "Giant Tumors of the Conus and Cauda Equina, Symptoms, Anatomical Findings, Operative Results," by Dr. Joseph Collins and Dr. Charles A. Elsberg. "A Peculiar and Undescribed Disease of the Roots of the Cauda Equina," by Dr. Charles A. Elsberg and Dr. Foster Kennedy. "Bilateral Oculomotorius Palsy from Softening in Each Oculomotorius Nucleus," by Dr. William G. Spiller. "A Contribution to the Pathology of Myasthenia Gravis," by Dr. Sydney Kuh and Dr. Morris Braude. "The Feeble Minded in Massachusetts Outside of Institutions," by Dr. William Noyes. "The Interpretation of Differences in Mammalian Brain Weight in Terms of the Structural Elements," by Dr. Henry H. Donaldson. "A Further Study of Brain Anatomy in the Dementia Præcox Group," by Dr. E. E. Southard. "Lesions of the Hypophysis and of the Uncinate Region, with the Records, Clinical and Pathological, of a Series of Cases," by Dr. Charles K. Mills and Dr. Williams B. Cadwalader. "Huntington's Chorea; A Study in Heredity," by Dr. Smith Ely Jelliffe, Dr. E. Muncey and Dr. C. B. Davenport. "Further Researches in Voice and Speech in Nervous and Mental Diseases," by Dr. E. W. Scripture. "The Value of X-Ray Analysis of the Gastro-Intestinal Tract in Some Types of So-called Functional Nervous Disorders," by Dr. L. Pierce Clark and Dr. Archibald D. Busby. "The Role which Heredity Plays in Inducing Epilepsy in Children Suffering from Infantile Cerebral Palsy," by Dr. L. Pierce Clark and Dr. Edward A. Sharp. "Some Difficulties in the Diagnosis of Brain Tumor," by Dr. Theodore Diller. "Cerebral Palsies without Demonstrable Anatomical Findings," by Dr. John H. W. Rhein. "Experimental Study of Intracranial Injection of Alcohol," by Dr. Alfred Gordon. "Mental Morbidities of the Conjugal State," by Dr. Theodore H. Kellogg. "Report of a Case of Juvenile Tabes," by Dr. C. Eugene Riggs. "Remarks on the Histopathological Changes in the Spinal Cord Due to Impact," by Dr. Alfred Reginald Allen. "Present Status of Neosalvarsan in the Treatment of Parasyphilis of the Nervous System," by Dr. Edward D. Fisher. "Rebounding Pupils," by Dr. Frank R. Fry. "Epidural Injection in Cases of Incontinentia Urinæ of Organic Origin," by Dr. Israel Strauss. "Some Important Features of the Cerebro-spinal Fluid," by Dr. Israel Strauss. "Two Cases of Removal of Extra-dural Tumor of the Spinal Cord," by Dr. Philip Coombs Knapp. "The Distribution of the Blood Supply in the Brain," by Dr. S. D. W. Ludlum. "Review of the Results of Twenty-five Consecutive Laminectomies," by Dr. Charles H. Frazier. "The Status of the Feeble-minded Problem in Pennsylvania," by Dr. Charles H. Frazier.

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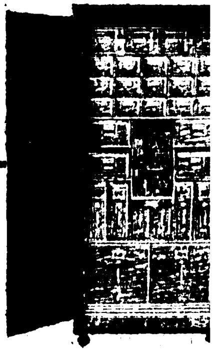

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The Journal OF Nervous and Mental Disease

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Original Articles

THE ABORTED FORMS AND PRE-PARALYTIC STAGE OF ACUTE POLIOMYELITIS AS OBSERVED IN THE BUFFALO EPIDEMIC[1]

BY EDWARD AFFLECK SHARP, M.D.

NEUROLOGIST TO THE ERNEST WENDE HOSPITAL, BUFFALO, N. Y.

The epidemic of poliomyelitis which has been prevalent in Buffalo and some of the surrounding towns during the past summer and autumn has been more extensive than any of the previous epidemics of poliomyelitis in Western New York.

In Buffalo the total number of cases reported to the Health Department up to November 1, 1912, was 310 cases with 41 deaths. Six of the cases occurred before July 1. In July there were 62 cases with 4 deaths; in August 124 cases with 16 deaths; in September 86 cases with 13 deaths; and in October 32 cases with 8 deaths.

Early in the epidemic the Health Department set aside two wards at the Ernest Wende Hospital where the acute cases could be sent and kept under observation and treatment, and a number of the physicians took advantage of this arrangement to have the cases under constant observation. The Department also made provision to have some of the hospital staff examine any cases suspected to be poliomyelitis and to assist in the diagnosis and study of the disease in the cases not sent to the hospital. By these means it was possible to study a number of the cases before the onset of any paralytic symptoms, and also a number which did not develop paralysis.

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[1] Read at the joint meeting of the New York Neurological Society and the Section on Neurology and Psychiatry of the Academy of Medicine, November 12, 1912.

From the standpoint of epidemiology and for the purpose of quarantine the cases were classified into three groups: (I) Suspicious; (II) Aborted; and (III) Paralytic. The aborted and paralytic cases were quarantined and the house placarded while the suspicious cases were not.

In the delimitation of these types the cases were considered suspicious if the child showed only constitutional symptoms of a general nature without any local nervous symptoms; the aborted cases were those in which some evidences of involvement of the nervous system were added to the general symptoms, but which did not go on to paralysis; and the paralytic cases included those in which a definite paralysis or prolonged weakness of muscles occurred.

If the delimitation of the aborted cases as given by Wickman had been followed most of the cases classified as suspicious would be considered as aborted. Gastro-intestinal disturbances have been quite frequent this year and a number of instances have occurred where one or more children in a family have had fever, vomiting and gastro-intestinal disturbances which cleared up in a few days and showed no signs of nervous involvement. Some of these have occurred in families where a definite paralytic case had developed and they should undoubtedly be classified as aborted rather than suspicious; in other instances the same gastro-intestinal symptoms have occurred in families where no other illness had been present.

As an example of the suspicious cases the following may be given as representing a not infrequent type. Two girls, twins, aged 3½ years, had visited a summer resort early in September where a few cases of poliomyelitis had occurred. The following day they were taken ill with fever, diarrhea, vomiting and headache. No rigidity of the neck or back and no pains, although in one of the children the back was said to be slightly tender. Diarrhea, with foul stools, lasted for nearly two days and then all the symptoms subsided. Three days after the onset of the illness there was not the slightest trace remaining and no evidence of any involvement of the nervous system.

It is impossible to get statistics on the frequency of these gastro-intestinal disturbances, and, unless there was some suspicion on the part of the attending physician or anxiety on the part of the family that the case might be poliomyelitis, they were not brought to the attention of the Health Department. The statements of some of the physicians who see a large number of children confirms the opinion that gastro-intestinal disturbances of about the type described above, and even greater severity, have been quite frequent during the past season. None of the so-called suspicious cases have been included in the statistics of the Health Department.

Considering poliomyelitis as an acute infectious disease produced by a specific virus, the term aborted as applied to the disease has been used in the present classification to mean that the paralysis and not the infection was aborted. The definition has therefore been extended to include such types described by Wickman as meningeal, polyneuritic and ataxic, and even some of the cases where a slight weakness was present for a few days, but in which recovery was prompt and complete.

Thirteen of the cases reported were considered aborted poliomyelitis. This falls far short of the actual number of such cases, and even if a large percentage of the so-called suspicious cases were found to be a simple gastro-intestinal or febrile disturbance, there still remains a considerable number where some slight involvement of the nervous system places the case quite definitely in the class of aborted poliomyelitis.

The following case was considered at the time of the illness as a simple gastro-intestinal disturbance and was not reported. A child two years old was taken ill with malaise, fever and vomited once. The fever lasted several days and the child would not take food. No pain, tenderness or stiffness of the neck or back. After one week was well but showed some weakness in the legs for a day or two. On examination, one month after the illness, no evidence of the attack could be found, but the clinical history, stating that weakness was observed for a day or two following the constitutional symptoms, would indicate a slight involvement of the nervous system, and the attack should have been considered as aborted poliomyelitis. This opinion is further strengthened by the fact that three days before the onset of the illness a sister 4 years old was taken ill with the same initial symptoms and became paralyzed.

In the examination of 180 cases (which includes a few from the surrounding towns) there were only 29 which are suitable for the present study, that is, those cases which were seen in a stage before the paralysis developed or which remained aborted.

The results of the examination in these cases are tabulated in the accompanying chart (Chart No. 1).

The earliest symptoms in all these cases were very similar and there was nothing to indicate which would become paralyzed and which would stop short of this. A similar history was obtained in most of the other cases examined, but as they were not under observation during the pre-paralytic stage, the data have not been utilized in the present summary.

Fever was noted in all the cases as one of the earliest symptoms; the usual course being a rather rapid rise, reaching its height about the second day. In the cases with marked meningeal symptoms the fever continued high longer than in the paralytic cases where there was a rapid decline to normal soon after the development of paralysis.

In 17 cases a more or less sudden onset of the symptoms occurred, while in the remaining 12 cases the onset was described as gradual. 10 of the cases showed a remission in the symptoms a day or two after the onset and the child was apparently well and allowed to run about. After a day or two intermission the symptoms returned with greater severity, and the majority of these cases appeared more severely affected than those without remissions.

The symptoms referable to the gastro-intestinal tract were those ordinarily accompanying any febrile disturbance and showed no distinctive character. Vomiting, although common, was not a troublesome symptom except in two of the meningeal cases where it was quite severe and of somewhat projectile character.

Constipation was present at the onset in 22 cases, and in some of them it had existed for several days before the appearance of other symptoms brought it to the attention of the parents. In two cases the constipation was of an obstinate degree and required active cathartics for several days before an evacuation could be obtained. One of these cases was so obstinate that a paralysis of the bowel was suspected.

In some of the cases, after the initial cathartic, the stools became thin, greenish and foul smelling for a few days. Diarrhea as an initial symptom was recorded only once.

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	Totals.
Sex	M	F	F	F	F	F	M	M	F	M	M	M	M	M	F	F	M	M	F	F	F	M	M	F	M	F	F	F	M	M = 14 F = 15
Age (in years)	4	7	5½	7	3½	7	2¼	¼	6½	11	4½	2	4⅓	19	6	5	5½	7	12	3½	5	6¾	7	5	11	16	20	6	½	
Onset { Sudden... Gradual.. }	S	G	G	S	S	G	S	G	G	G	S	G	S	S	S	S	S	G	G	S	S	S	S	S	G	G	G	S	S	S = 17 G = 12
Remissions	I	..	I	I	..	..	..	..	..	I	..	..	..	..	..	..	..	I	I	..	..	I	..	..	..	I	I	I	..	10
Fever	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	29
Vomiting	I	..	I	I	..	I	..	I	..	..	..	+	I	..	..	I	I	I	..	..	..	I	..	..	..	..	I	I	+	14
Constipation	I	I	I	I	I	I	I	I	I	I	..	I	..	..	I	I	+	I	..	I	..	+	..	I	I	I	I	I	..	22
Headache	..	..	I	..	I	I	I	..	I	I	..	..	I	I	I	I	..	I	I	I	..	I	I	I	I	I	I	I	..	20
Vertigo	..	..	..	I	..	I	..	..	..	I	..	..	..	I	..	..	..	..	I	..	..	..	I	..	..	..	..	..	..	6
Irritable	I	..	..	I	I	I	I	..	I	I	I	I	I	I	I	I	I	I	..	..	I	..	..	I	I	..	..	I	I	20
Drowsiness	I	I	I	I	I	I	I	I	I	I	I	I	I	..	I	I	I	I	I	I	I	I	I	I	I	..	I	..	I	26
Jerking—twitching	I	I	I	I	I	I	I	..	..	I	I	..	I	..	I	I	..	I	I	I	I	I	I	I	..	..	..	..	..	19
Tremors	I	I	..	I	..	..	I	..	..	..	..	..	I	..	I	I	..	I	..	I	..	..	..	..	..	..	..	..	..	9
Nystagmus	..	..	..	..	..	I	..	..	..	..	I	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Pain in neck	..	I	I	..	..	I	..	I	I	I	I	I	I	..	I	I	I	I	..	..	I	I	I	..	I	..	I	I	..	19
Stiffness of neck	I	I	..	..	..	I	I	I	I	I	I	I	I	I	I	I	I	I	I	..	I	I	I	..	I	..	I	I	I	23
Retraction of head	..	I	..	..	..	..	..	..	..	..	I	I	I	..	I	..	..	I	..	..	..	..	..	..	I	..	..	I	I	9
Pain in back	..	..	I	..	I	..	I	..	..	I	I	I	I	I	I	I	I	I	I	..	..	I	..	..	I	I	..	I	I	18
Rigidity of spine	..	..	I	..	..	..	..	..	I	I	I	I	I	I	I	..	I	I	..	..	..	..	I	..	I	..	..	I	..	13
Pain in extremities	..	..	I	..	..	..	+	..	..	I	+	..	..	I	I	I	..	..	+	..	..	I	..	..	..	I	..	+	..	11
Kernig. Brudzinski	..	..	..	..	..	..	..	..	..	K	K	KB	KB	..	..	..	..	KB	K	..	..	..	K	..	K	..	..	KB	..	K = 9 B = 4
Reflexes	+	+	+	+	+	+	..	+	+	++	+	+	+	..	+	+	w	++	+	+	+		++	..	+	+	+	+	+	
Ataxia	..	..	..	I*	..	I*	..	..	..	..	I	..	I	..	I	..	..	..	..	I	..	..	..	..	I	..	I	..	..	8
Dysarthria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	I	I	..	..	..	..	..	..	..	2
Temporary weakness	..	..	..	..	I	..	I	..	..	..	..	..	I	..	..	..	..	..	..	I	I	I	..	I	..	I	..	..	..	8
Cerebro-spinal fl.	..	..	..	..	..	..	..	..	I	I	..	I	..	I	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Types	P	P	M	A	W	A	W	S	P	M	M	M	M	P	M	S	S	M	S	W	W	W	M	W	M	W	M	P	S	..
Time before P or W.	3	3	..	..	2	..	1	..	2	..	..	..	..	5	..	..	..	..	..	..	2	4	..	2	..	14	..	8	..	..
Result	R	P	R	R	R	R	R	R	D	R	R	R	RR	P	R	R	R	R	R	R	R	R	R	R	R	R	R	P	R	..

Chart No. 1. Results of Examination in Aborted Cases and Pre-paralytic Stage of Acute Poliomyelitis.

In nearly all the cases the tongue had a thin grayish-white coating, through which the papillæ could be seen as minute punctate spots.

In twenty of the cases more or less severe headache occurred at some stage of the disease, usually at the time, or just before, other symptoms of meningeal irritation were appearing. Some of the younger children may have had headache which was only manifest in the tendency to cry.

Vertigo was complained of in six of the older children.

Twenty of the children were described as being very irritable and restless. This was noticed particularly when the child was aroused from its state of drowsiness or tendency to sleep most of the time, which latter symptom was more or less marked in all but three of the cases.

All of the above mentioned symptoms are of such a general character that a diagnosis of poliomyelitis might be questionable without some more definite evidence of local nervous involvement. It is for this reason that the cases which showed nothing more than these general symptoms, although occurring during the epidemic, were considered as suspicious rather than as aborted poliomyelitis.

When, to the above symptoms, some evidence of meningeal irritation, or other involvement of the nervous structures was added, however slight they might be, the cases were more confidently considered as aborted poliomyelitis.

Jerkings or twitchings in the muscles was observed in 19 cases. Usually this was present only during sleep. In the cases which later showed some paralysis the jerkings or twitchings had not been observed to be more severe or localized in the muscles which became paralyzed.

A number of the cases showed such severe meningeal symptoms that they might be classed under the meningeal type of Wickman.

Pains in the neck and back, most marked on movements of the spine in anterior flexion, and stiffness of the back with tenderness along the spinous processes, and more or less retraction of the head were the symptoms characteristic of the meningeal cases.

In case No. 12 the meningeal symptoms were so severe that at first tuberculous meningitis was considered more probable than poliomyelitis. The child, 2 years old, was taken ill with malaise, fever and constipation. Two days later he vomited the castor oil which had been given and then had frequent vomiting spells of almost projectile character. Stiffness of the neck and back were observed at this time, increasing in severity and these parts became rigid and extremely sensitive to any movement. The Kernig and Brudzinski signs were present. The child would lie on the bed with the head retracted, but was able to move the extremities if the spine could be kept rigid. The cerebro-spinal fluid showed a considerable increase in lymphocytes. The child made a complete recovery, and within two weeks no evidence of the former illness could be demonstrated.

In some cases the meningeal symptoms have been very severe before the development of paralysis.

Case No. 28, a girl 6 years old, was taken ill with fever,

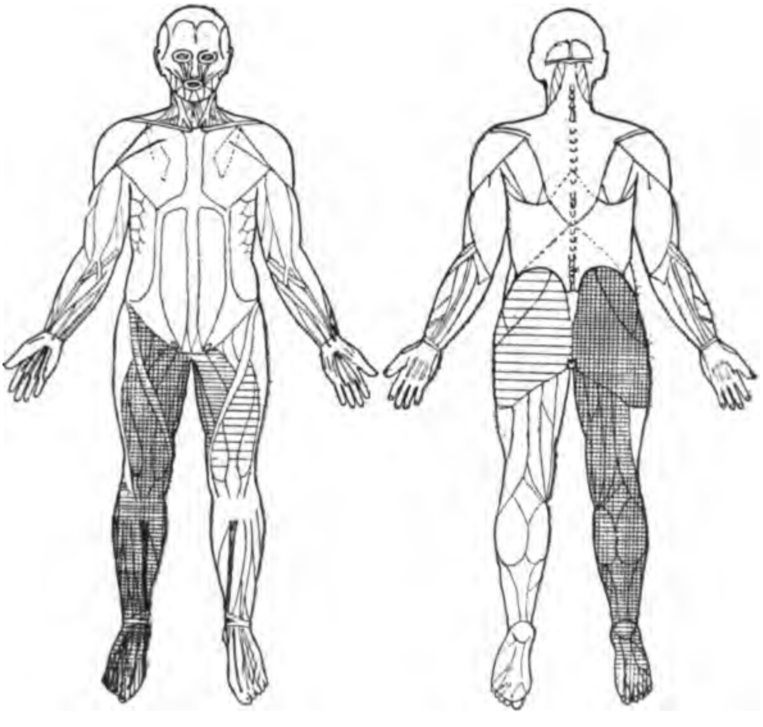

CHART No. 2. Case No. 28. Showing extent of muscle involvement after paralysis had reached its height.

vomiting and pains in the head for two days. Then felt somewhat better but was unable to walk on account of pains in the back and legs. There was no definite weakness. One week later was admitted to the Ernest Wende Hospital. At that time the meningeal symptoms were very severe; the head was held retracted; the spine rigid in opisthotonos; the lower extremities flexed at the hips and knees and very painful on any attempt to move them. The child would lie on the left side and was so stuporous that she could not be aroused by shaking, but awakened with a scream when the legs were extended. At this time all movements were present and were limited only by the pain. During the first week in the hospital the meningeal symptoms gradually subsided, and with this a paralysis of the lower extremities developed. The right extremity became motionless and the left showed considerable loss of power. On September 4, one month after the onset of the illness, the paralysis was as represented in the accompanying chart (No. 2). There was loss of all movements in the right lower extremity, except abduction with slight outward rolling of the thigh produced by the action of the tensor of the fascia lata and a weak sartorius. The left side showed considerable weakness of the adductors and some weakness of the quadriceps and glutei. All the other functions were normal.

Pain or some sensitiveness in the extremities was complained of in ten of the cases, and in four of these the tenderness was definitely limited to the course of the nerve trunks. The pain and tenderness usually increased with the onset of the paralysis and became a troublesome symptom during the first week or two. In the cases which did not go on to paralysis the pains and tenderness subsided with the decline in the other meningeal symptoms. In the latter class the pains appeared definitely of a meningitic character, while in the former they had the character of a peripheral neuritis.

The tendon reflexes were present during the early stages, and in the meningitic types they were greatly exaggerated. With the onset of weakness or paralysis the tendon jerks diminished and were finally lost on the paralyzed or weakened extremity.

In the accompanying chart (No. 1) there are only five of the cases which are classed as simple aborted. These cases showed only slight meningeal symptoms in addition to the constitutional disturbances.

In ten of the cases the meningeal symptoms were very severe, giving the course of the illness a distinctive type. They all recovered without paralysis, except one (Case 13) in which a slight weakness of the right leg was present for a few days.

Some disturbance of the motor functions of the cranial or spinal nerves occurred in 19 of the cases.

Ataxia was observed as a temporary condition in eight cases, and in two of these it was of sufficient prominence and not associated with severe meningitis or muscle weakness that the cases were classed as ataxic. Two of the cases were associated with a slight nystagmus of temporary duration.

In seven cases there was a slight temporary weakness of one or more extremities followed by complete recovery in a few days.

A slight disturbance in speech was observed in two cases, in one of which a transient weakness of the left face, with slight dysphagia and double vision, occurred. All these disappeared in a day or two.

While it might be claimed that the cases showing these temporary motor disturbances should be classified as paralytic rather than abortive, the condition was so slight and fleeting in most of them that the term paralytic applied to such cases gives an erroneous impression of the clinical course of the disease.

Five of the cases developed a severe degree of paralysis from 2 days to a week after the onset. One of these has apparently recovered in two months. One case died of a rapidly advancing Landry type of the paralysis with involvement of the muscles of respiration. In the other three cases the paralysis persists and is probably more or less permanent.

Summarizing the findings in these 29 cases and comparing them with the suspicious cases and the remainder of the paralytic cases observed during the epidemic, it is found that all grades of transition occur from the mildest gastro-intestinal or simple febrile disturbances to the severe paralytic and rapidly advancing fatal cases. While the majority of the cases observed during the epidemic conformed to the regularly recognized types of the disease, transitional and mixed types were not uncommon.

Until some reliable diagnostic criterion can be found, based on chemical, bacteriological or other laboratory evidence, the etiology of many of the febrile disturbances of early life must remain questionable. That some of these are produced by the virus of poliomyelitis appears highly probable.

The work on the cerebro-spinal fluid obtained by lumbar puncture has been done by Dr. Nelson G. Russell and his report is included in this paper to complete the clinical data.[2] It is as follows:

"It would be a very great aid in this study if one could add the spinal fluid examination in each case, but the indefinite variety of the early symptoms coupled with the doubtful value to the patient renders this almost out of the question.

"The findings in the aborted cases do not differ very much from those in the paralytic cases.

"The examination of thirty-five cases of poliomyelitis in the paralytic stage from the second to the eleventh day gave an average count of thirty-seven cells to the cu. mm. and a polynuclear count of not more than 3 per cent.—eight cells on the fourth day and 132 on the third day being the limits. Two cases in the preparalytic stage gave an average count of 78 cells, one showing a 10 per cent. polynuclear count and both giving strong globulin reaction. Four cases which were classed as aborted gave an average count of 27 cells, the lowest being 19 cells.

"During the epidemic we had four cases of tuberculous meningitis, which gave counts not differing from a poliomyelitis count, although one gave over 300 cells. In two of the cases the tubercle bacillus was found in the spinal fluid, but in the others we were unable to determine the diagnosis definitely until post mortem.

"Unfortunately for the diagnostic value of the examination of the spinal fluid, we encountered, toward the end of our series, at least one other condition which gave the characteristic poliomyelitis findings and which proved to be typhoid fever with meningeal symptoms. The patient had symptoms of digestive disturbance, meningeal irritation, stupor and irritability; at times pain in the neck and slow reflexes. The spinal fluid gave a count of 23 cells, 12 per cent. polynuclear and an increased globulin reaction. This seemed to be quite like an aborted case of poliomyelitis but he was probably suffering from typhoid fever, for he gave a positive Widal reaction three days later and had a perfectly normal typhoid fever course.

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[2] Presented in the discussion of the foregoing paper.

"The globulin reaction showed some increase in every case, although not in proportion to the cell count.

"Fehling's solution was reduced in all cases but one, that being the fluid in the pre-paralytic stage in one case. In this case the fluid had been kept over night, which may have modified the reaction to some extent.

"While the spinal fluid examination is of great value as an aid, the fact that tuberculous meningitis and the meningeal irritation of acute infectious diseases give such similar symptoms and spinal fluid findings, the result of a single examination is only an aid and is not by any means positively diagnostic."

MIRROR WRITING AND OTHER ASSOCIATED MOVEMENTS OCCURRING WITHOUT PALSY

By Charles W. Burr, M.D., and C. B. Crow, M.D., U.S.N.

(Read at the meeting of the Philadelphia Neurological Society, January 24, 1913)

The man whom we exhibit shows the following curious condition which has existed since infancy. Whenever he makes any complicated voluntary movements with the fingers or wrist of either hand the other hand involuntarily makes the same movements. Very simple motions such as flexing or extending one finger can be made independently but even then as a rule there is a similar simultaneous movement of the corresponding finger of the other hand. The affection is confined to the hand muscles and does not appear when the upper arm alone is used. The feet and toes are not affected. By strict attention he can prevent the unused hand from moving but he cannot, for any length of time, keep his attention fixed both on what he is doing and on inhibiting the hand. In this he illustrates well the psychological fact that only one thing can occupy the center of the field of consciousness at any one time. Secondly, writing done by the left hand is reversed whether he uses the left hand alone or both hands simultaneously.

His history is as follows. He is twenty-seven years old. His family history is, so far as we have been able to discover, good, except that one cousin on his mother's side is an imbecile. His mother states that when he was born, or at any rate soon after birth, his hands seemed to be useless, seemed to her, as she remembers the condition, to be palsied. The labor itself was normal and he showed no trouble save that of his hands. When he grew a few months older she noticed that any movement in either hand was accompanied by movement of the other. As a boy he could use both hands simultaneously for certain different uses with little or no trouble, *e. g.*, he could use a knife and fork. He attended school between the ages of six and fifteen years. He states that during the first three years in school he made little progress but after that he did as well as his schoolfellows. He tried after he left school to learn a trade but could not do so on account of the fact that each hand did or tried to do whatever he was doing with the other. He could do farm work, such as plowing, driving a horse or other occupations in which the whole arm was used, but he could not learn any trade requiring the simultaneous use of the muscles of both hands in different ways. When he was twenty-five years old he joined the navy as an apprentice seaman, did his work well, and had a good record until he was ordered to climb a rope. He demurred and it was found that on letting go with the lower hand to reach for a higher grip on the rope he let go with the other hand and hence fell. This is a mere illustration of many similar incidents. During his examination by the ship surgeon he was given two pencils and told to write with both hands. It was then discovered the left hand wrote mirror writing. The man had never used the left hand to write with before and did not know anything about the matter. His previous medical history is good; he has no bad habits, and has done his work well in the service.

Physical examination to-day (January, 1913) reveals no remnant of palsy in either hand, nor elsewhere in the body. He has no ataxia, tremor, spasticity, disorder of the reflexes, nor disturbance of sensibility. His mental condition is good. Articulation is normal. He is not nervous, hysterical, or dissipated. There is no discovered motive why he should want to leave the service.

There are two separate elements in his case or rather one, mirror writing, is a specialized instance of the other associated movements.

As to the mirror writing, though it is frequently seen in imbeciles and sufferers from infantile cerebral palsy we think that it is the natural and physiological way for right-handed persons to write with the left hand. If you tell an average child to write with the left hand and notice what he does you will see that he will very often spontaneously write from right to left and that though the formation of the letters will ordinarily be very bad it will tend to be reversed: if you take an educated man who writes with facility, especially if he writes artistically, and tell him to write with both hands, allowing the left one to have its own way, he will produce an admirable example of mirror writing. He will write in the ordinary way only if he uses his will to make himself do so. The real reason that imbeciles write reversed with the left hand is not that they are imbeciles but because, being imbecile, they permit the hand to do what it will without trying to control it. Handwriting by the two hands is not naturally identical but symmetrical. Good mirror writing in entirely normal people is nothing like as unusual an accomplishment as is commonly supposed.

The causation of associated movements is a much more complex and obscure question. They are most often seen in adults in the palsied hand in hemiplegia. They do not always need voluntary movement of the healthy corresponding organ to excite them, indeed movement of any part of the body may cause them, *e. g.*, a sneeze may cause a palsied hand to flex or even the whole arm to move. A man may not be able to close the palsied hand by effort of will and yet close it well if he voluntarily close the nonpalsied hand. When there is some power in the palsied part voluntary movement of it may cause involuntary movement in the nonpalsied corresponding member. In these cases of associated movements in palsy the movement in the palsied hand rarely mimics completely any complicated action in the well hand. The explanation of them is probably bilateral cerebral representation plus motor overflow.

A theoretical or rather a hypothetical explanation of our case can be made by going back to the development of voluntary movement. The little child when it attempts to move an arm or a leg or any part of the body moves the whole body. It is only after long training that it can restrict the movement to the one part of the body which it wishes to move. Now it is a possible explanation that there is slowly developed a power of inhibition and that our patient so far as the hands are concerned has never learned this inhibition. It may be also that there is, as Dr. Spiller suggests as a possible explanation, a complete bilateral representation of the hands in the cerebral motor cortex in this case.

We can scarcely believe that the condition in our patient is due to any local pathological process occurring at birth because, as said before, there is absolutely no sign left of any such thing having happened and there is practically always some physical sign left when a child has had an injury to its brain sufficient to cause a palsy of the hands.

CEREBELLAR TUMOR. GLIOMA. OPERATION. RECOVERY

By Max Mailhouse, M.D., and Wm. F. Verdi, M.D.

New Haven, Conn.

The patient, a young girl, bright and of cheerful disposition, just passed her fifteenth birthday, began to complain of headache in November, 1910.

The family history has no bearing on the case. Her father died of nephritis at the age of 56 years, and one sister died shortly after birth of hemorrhagic disease. Her mother complains constantly of headache. One brother has pulmonary tuberculosis in the arrested state. Her remaining brothers and sisters are in good health.

As a child she was robust and escaped the usual diseases of childhood, other than chicken-pox and an uncomplicated attack of measles. Her early school life was not interrupted by illness. On one occasion when two years of age, she fell down a flight of stairs striking on a hard cement floor. From this fall there resulted a marked contusion of the forehead, with considerable ecchymosis about one eye, whether it was the right or left eye we are not certain. Nothing eventful followed, however.

In April, 1909, then in her thirteenth year, she became dizzy when dancing and fell, striking her forehead with considerable force on a very hard floor. Aside from a marked contusion over the left eye, there were no immediate symptoms. Several months after this, however, she began to lose flesh. Her appetite, previously good, became whimsical. She became constipated, suffered from nausea, especially in the morning, and occasionally experienced other digestive disturbances during the day, but no headache. The year following, 1910, she first menstruated. She was then fourteen years of age. Her menses continued with regularity until the early fall. There was no improvement, however, in her physical condition. It was in November that she first suffered from headache. It began with nausea in the morning and lasted throughout the day; at this time she did not localize the pain. For some time it had been noticed that she was a mouth-breather, and with the idea that possibly the headache might be traced to the presence of adenoids, an operation was performed and a fair sized mass of adenoid tissue removed.

On December 13, 1910, she awoke in the morning feeling indisposed. She was nauseated and suffering from a very severe headache, more marked in the occipital region but soon extending over the entire cranium. This was accompanied by distressing retching and vomiting. The vomitus contained no undigested food. After thirty-six hours this attack subsided and she was about in her usual health. She noticed, however, that when walking with her companions she would at times bump into them, undoubtedly the first manifestation of staggering gait.

In January, 1911, she had a moderately severe attack of mumps, which continued for about two weeks. No complications or sequelæ followed. Toward the close of the month, after a fairly comfortable night's sleep, she awoke one morning complaining of sickness of the stomach, accompanied by a dull headache in the occipital region, which became much worse during the forenoon and again extended over the entire cranium. She described it as a throbbing pain which became more intense when she moved about in the bed. It was attended with vomiting and it was necessary for her to remain absolutely quiet in the horizontal position in order to restrain the tendency to vomit. It was observed that she generally preferred to lie on one side or the other, never remaining on her back. Unlike her previous attack, the second day was equally as bad as the first and no medication seemed in any way to influence it.

The next attack occurred in the middle of February and it was now noted that they were becoming more frequent and also that they were of longer duration; vomiting was more frequent also, and, during the attacks of headache, was brought on by any attempt to move in the bed. The headaches were now of such severity that she would lie with the eyes closed for hours, entirely regardless of anything about her. There was tenderness now over the entire scalp but this was more marked in the occipital region. The vomiting was never of the projectile type. During this whole period of illness the optic disks and the vision were normal and careful physical examination failed to reveal any signs of intracranial pressure. The urine, whenever examined, was normal. A von Pirquet test was made and gave a positive reaction; this however, as is so often the case, proved of no value. It was observed that amenorrhea had been present since November, which was the time of onset of the headaches. The blood-pressure was not raised nor was the pulse rate materially diminished, this averaging 72 most of the time. The temperature during the attacks was slightly elevated, varying from 99° to 99.5° F. There never was at any time, vertigo, rigidity or retraction of the neck muscles. By March first the patient was showing the effect of her repeated illnesses and suffering, by a considerable loss of weight. Hearing was never impaired in any degree. On March 1 began a severe attack, of a week's duration, similar to the others in its general symptoms. Soon after, the optic disks began to show evidences of intracranial pressure and the extraocular muscles signs of defective innervation. There now appeared slight swaying to one or the other side on walking a straight line, a moderate false nystagmus, she held her head slightly cocked with the occiput leaning toward the right shoulder and the face looking toward the left, slight awkwardness in attempts at rapid pronation and supination of the forearms but no differences between the right and left. The knee-jerks, at first quite feeble, were later obtained only by reënforcement; the Romberg symptom was not present. There were no changes in tactile, pain and temperature sensations and there was no astereognosis. The speech took on an explosive character. She was unusually jovial, but there was no "Witzelsucht." When in bed at this period, the posture was that of a fetus in utero, the limbs and head all flexed. There was now slight ataxia by the finger to nose test, the finger coming up rather forcibly on reaching its destination even though coming up fairly directly toward the nose; this was also equal on the two sides. There was no asynergy evidenced in the lower extremities. The attacks of headaches were now coming on weekly, the patient having one on March 28 and again on April 7, and the ocular changes became more pronounced and threatening.

Dr. Arthur N. Alling reported as follows: March 1. Mild optic neuritis, especially in the right eye. Fields normal. Insufficiency of the internal recti. Nystagmus on looking to the right and left. Vision 20/20 in both eyes.

April 1. Decided edema of nerves. Form and color fields normal.

April 9. Violent choked disks; numerous hemorrhages; veins congested. Mobility limited in all directions. Nystagmus.

On April 8, however, Dr. B. Sachs, of New York, saw the patient and it was agreed that an operation be undertaken if conditions continued to grow rapidly worse. At this time also arose the question of a possible frontal lobe abscess following the adenoid operation shortly before the onset of the headaches; this was however ruled out by report of the blood examination which showed no leucocytosis, and incidentally but a moderate anemia.

Dr. Alling's report on the 9th having indicated a critical condition of the eyegrounds, a cerebellar decompression was done by Dr. W. F. Verdi, on the evening of April 9, which will be described in the surgical report.

After the operation, the retinal hemorrhages soon began to be absorbed and the swelling of the disks to subside, and by the end of two months the appearances of the eye-grounds had become quite normal. The headaches and vomiting ceased at once and she gradually gained in strength, so that she was able to go to the seashore for the summer. There remained however a marked instability in her gait which was considered by one of the consultants as possibly due to the loss to the cerebellum of its bony support normally given by the occipital bone.

Four months after the operation, her staggering gait became more pronounced and objects began to dance before her eyes; there was no headache or vomiting however. At this time her menstruation had returned. She came home in September exhibiting a marked cerebellar gait, marked false nystagmus and an explosive speech; there were no other symptoms. Together with the following reports upon the eyes, by Dr. Alling, there was a steady progression of her symptoms:

Sept. 7, 1911: Both nerves show blurring, especially the left. Fields for color narrow (red only 10 degrees). Form fields slightly contracted. Vision 20/20 in each eye. Oct. 3, 1911. Nerves better. Nystagmus, except on looking downward. Red and blue fields interlacing. Motility markedly impaired.

At a conference held on October 9, at which Drs. Dana, Starr and Sachs were present, it was agreed that a neoplasm existed but that it was not localizable, that it was quiescent either in a stage of resolution, or cystic degeneration was taking place, or possibly absorption.

An X-ray picture taken on October 10 showed nothing.

Early in January, 1912, and on two other occasions before the second operation, there were slight headache, nausea and vomiting; the gait grew worse, the nystagmus more pronounced and the movements of the limbs more ataxic; but she could still, and even up to the time of the radical operation, handle her knife and fork.

On January 2, 1912, some edema of the optic nerves was noted. On March 3 the ocular phenomena were decidedly worse and on March 30 both nerve heads were reported as much blurred and the eyegrounds decidedly worse, but the vision and the visual fields were still normal. At this time it was also noted that the patient was markedly clumsy in all her movements, ataxia by the heel to the knee test was present, nystagmus was worse, and the back of the head at the seat of the operation was tender and bulging.

Doctor Sachs again saw her about April 1, and advised a second operation within a few weeks, although the side upon which the tumor was located had not been determined. The operation was performed on April 10, 1912, and the details appear in the surgical report, following which further report with additional comments will appear.

Surgical Report.—Dr. Wm. F. Verdi. The first operation consisted in the removal of the occipital bone and the dura. The incision was a cross-bow, a curved incision from one mastoid to the other and a vertical incision from the external occipital protuberance downward to the spinous process of the third cervical vertebra. An opening was made on each side of the size of a silver dollar, and the occipital sinus tied, the partition between the two openings having been removed. The dura was tense and pulsation barely perceptible; it was first opened at the upper margin of the opening in the skull and reflected downward. Both sides of the cerebellum bulged markedly, the right apparently the more. The color of the cerebellum was about normal; there were no dilated vessels.

The surfaces were palpated, and nothing being noted, the finger was introduced between the dura and the cerebellum, and that portion of the cerebellum lying under the tentorium was explored; the exploration was also extended down as far as the foramen magnum, the posterior margin of which had been removed during the operation of opening the skull. This exploration revealing nothing, a small incision was made into the cerebellum, parallel to the convolutions; its substance was explored to the depth of ¾ of an inch and nothing abnormal found. It was now thought best to cease further manipulations because of the indefiniteness of the location of the cause of the pressure, and the dura was excised in the area of the field of operation; the aponeurosis was closed, a small cigarette drain having been first inserted in the lower angle of the wound. Recovery from this operation was uneventful.

The second operation. The incision followed the lines of the previous one. When the flaps were reflected backward and downward, but mild adhesions were found to the surface of the cerebellum and these easily yielded without hemorrhage. The surface of the cerebellum presented the usual appearance found after a decompression operation; *i. e.,* the convolutions were flattened out and the color presented a slatish and carnified appearance; otherwise the surface indicated nothing except that the sulcus between the two hemispheres was practically obliterated.

The hemispheres were palpated and it was thought that a resistance could be felt deeply on the right side near the median line; a transverse incision was made into the cerebellum in this region and the surface of a solid tumor was exposed. The finger was then inserted into the incision and by gentle manipulation the tumor was separated from the cerebellar tissue for a distance of three or four centimeters over its circumference; during this procedure it was found that the tumor extended across the median line and invaded the left hemisphere. The solid tumor could now be felt as far as the finger could reach. Three fourths of the mass was estimated to occupy the right hemisphere. It seemed to be well encapsulated. After a sufficient surface had been exposed, a Bier cup was applied and this proved an excellent means of holding the tumor for further enucleation. The growth appeared to be firmly adherent in its deep attachments and great difficulty was experienced in attempts at its complete enucleation on account of its great size and the relative smallness of the aperture in the skull. In one place the examining finger broke into a softened area of the tumor. Finally the tumor was apparently completely enucleated and it was then found that a thin layer of cerebellar tissue covered the surface of the growth over a portion of its deeper surface on the right side. From the manipulations, which were necessarily extensive, considerable injury to the surrounding cerebellum was done; more so even, by the crowding of the growth in its extraction.

The contents of the cerebellar cavity which remained after the tumor had been removed, presented a macerated appearance; the remaining tissue appeared crushed and grumous-like. Hemorrhage throughout the operation was slight. All attached cerebellar tissue lying over the margins of the wound was turned in, a drain was inserted in the lower angle, the aponeurosis was brought together with chromic gut No. 1 and the scalp was sutured with silk worm gut as in the previous operation. The patient left the table in a condition of moderate shock from which she soon emerged, and, with the exception of a temperature in the neighborhood of 101°, lasting nearly three weeks, made an uneventful recovery. In spite of the elevation of temperature the patient was always cheerful, took nourishment well and complained of nothing whatsoever.

Following the operation, there was marked nystagmus for several days; the headache and vomiting ceased at once and have never returned. There was marked incoördination of the hands, arms and legs, and especially prominent for some time was the inability to maintain the head in the erect posture; the speech became much more explosive and also somewhat slurring, but this gradually improved. On May 25 she returned to her home from the hospital and spent the summer at the seashore. It was two months however before she was able to walk without the assistance of two persons, and the tremor of the head, noted when she first got up out of bed, very gradually passed away. On August 1 she was able to stand without assistance.

Dr. Alling's report on the eyes in October, 1912, says: The nerve-heads are practically normal in appearance; the fields and vision are normal; the motility and nystagmus are improved.

Examination, December 1, 1912.—The patient is very well-nourished indeed and is stouter than ever before, and has a good healthy color; the muscles on the extremities are full and firm. She stands erect without tremor of the head. She can stand alone with hands to hips and with feet fairly but not quite close together; when she closes the eyes she sways, but not very badly.

She walks, ever, with a mixed tabetic-cerebellar gait, and in walking has to be steadied in slight degree by another holding her one hand. Her speech is still slightly explosive. Her countenance has a somewhat blank expression similar to that of a blind person, notwithstanding that her vision is normal. There is still a moderate false nystagmus, though the lateral movements are much slower in rythm than formerly; this is most noticeable on attempts at external fixation with either eye. There is moderate adiadokokinesis in the left but none in the right forearm, but she can put on her knit gloves without difficulty and without swaying, and also without assistance. There is some asynergy in both lower extremities, but it is not intense. Her handwriting is good. It is now proposed to subject her to a course of the Fränkel movements in the hope of reëducating her muscle balance in so far as may be possible.

The pathological report of the Cerebellar Tumor, from Dr. Wm. J. Sheehan, is as follows:

Microscopical sections were made from the predominant grey yellow substance, from a portion showing a typical recent hemorrhagic focus, from the wall of one of the numerous enclosed cysts, and from the apparent capsule. The predominant feature is the fairly cellular character of the tumor mass; composed of stellate neuroglia cells. These even in the most cellular portions show numerous well-developed filamentous processes. The blood vessels are numerous and there are frequent extravasations of blood, there being all gradations from recent ones to where necrosis has taken place and cysts have resulted. The cyst walls of coagulation necrosis material are surrounded by a fairly dense mass of small lymphoid cells, seemingly proportionate to the size of the cyst; there being but few around the smaller, and there are not more around the areas of hemorrhages than would be accounted for by the blood. The capsule does not show any neuroglia cell content.

Diagnosis.—Cerebellar glioma, multiple cysts of degeneration.

Weight of tumor, 107 gm.; longest diameter, 7.5 cm.; short diameter, 6.8 cm.; thickness, 4.7 cm.; circumference, broad, 16.8 cm.; circumference, long, 18.5 cm.

EXPERIMENTAL STUDIES ON THE NERVOUS MECHANISM IN THE PRODUCTION OF HYPERPLASIA

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Du Bois-Reymond in 1843 (1) first gave us our definite knowledge of the electrical properties of living tissue. A muscle with its nerve, removed from the body, gives different electrical potentials at the cut surface and at the longitudinal uninjured one. Therefore, a flow of current, measurable with a galvanometer, is determined between the two points. This makes of such a muscle-nerve preparation an actual electric battery. Du Bois-Reymond maintained that these currents existed continuously in the living body during life. Claude Bernard (2), opposing him, stated that the current is found only in active tissue and not in quiescent muscle; and Hermann (3), following him, found that in uninjured muscle the potentials at various points were equal, and therefore no current was produced. He called the "natural currents" of Du Bois-Reymond, "currents of injury." Both of these objections, however, seem invalid; for there is no such thing in the living body as a quiescent muscle, and one cannot determine differences of potential by taking points on the surface of the muscle only. In fact, the chemical changes constantly taking place coincident with metabolism in all tissue must determine a current flow. I do not desire at this time to present any arguments either for or against the theory of a constant flow of current pervading all the living structure, produced by these living processes of metabolism; and conveyed by the various nerve elements to the controlling and regulating central systems, thence in its modified form returning to its points of original departure, completing the cycle. Sufficient to state now, that there is a great probability of the presence of such a circulating nerve current; circulating, for it has never seemed reasonable to suppose that a nerve impulse, *if electrical in character,* could be initiated at one end of a path to produce an effect at the other end, without there being a completed circuit back to the point of original departure. The existence of complete circuits for the nerve impulses to travel might necessitate the presence of many more axones than nerve cells. Of course, this would be in opposition to the present theory of neurones each with its *one* axis cylinder. But both Nissl (4) and Bethe (5) state that from their studies they are convinced of the far greater number of axones present in the cerebrum than nerve cells, and advance this fact as destructive of the neurone theory of Waldeyer. Furthermore, Ramon y Cajal (6), in describing certain end-organs of the skin, states that "each nerve trunk divides into *two* branches which surround more or less perfectly the hair follicle, each with a free extremity. The ordinary end organ is innervated by *two* independent systems of fibers." So that we see that histologically there may be a basis for a completed circuit for the nerve impulse.

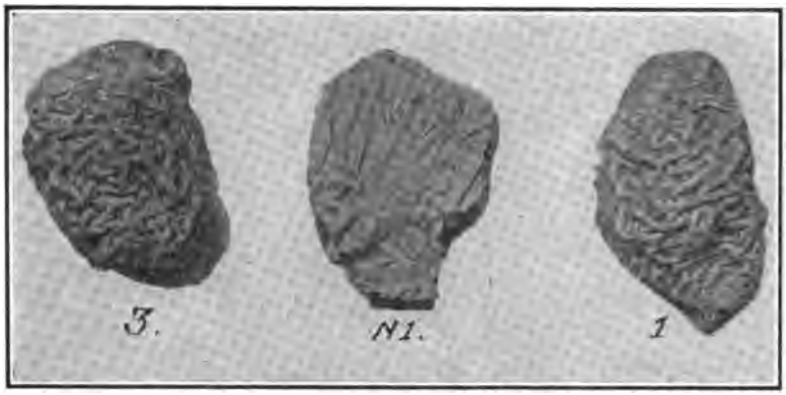
Proceeding then upon the above supposition, that the nerve impulses produced by metabolism travel in certain circuits, it remains to find an organ with its nervous mechanism suitable for experimentation. For many reasons, the vagus nerve (below the branches given off to the esophageal plexus), and its related organ, the stomach, offer ideal conditions. This organ receives fibers from both the vagus and the sympathetic; and moreover, these fibers do not travel in a common trunk, as is the customary condition elsewhere in the body, but arrive independently; uniting only at the plexuses of Meissner and Auerbach within the stomach wall. L. R. Müller (7) is authority for the statement that the vagus is differentiated from all other cranial nerves, for the reason that it serves the abdominal organs without the interposition of sympathetic ganglia; and that there is a distinct antagonism between the vagus fibers and the sympathetic to the stomach, both physiological and pharmacological. And Haidenhain (8) states that the physiological functions of these nerves on the gland cells of the gastric mucosa are respectively "secretory" and "trophic."

Now, if, without disturbing too much the motility and function of the stomach, we can succeed in causing the nerve current produced by the activity of the gastric cells to flow in diminished volume via the vagus, the excessive remainder must travel by the sympathetic. If it travels this route it incidentally stimulates the control exerted by this system over the *trophic* functions of the gastric cells, i. e., their growth, reproduction and repair. Our problem was to determine the truth or falsity of this inference. Furthermore, the method of operating upon the vagi, heretofore, was simply to divide them. (Schiff (9), Pawlow (10), Cannon (11), v. Yzeren (12)). This not only actually interfered with their part entirely in the digestive process, but also provided a situation rarely, if ever, met with in actual life—a distinct nerve separation. By the present method of vagus ligation, while the nerves are not left entirely intact, yet a sufficient number of fibers are left to carry on some of the vagus function, and a condition frequently met with in actual life is reproduced—namely a pressure neuritis.

Operation.—The animals used for experimentation were cats, and they were prepared for operation by the usual methods. The anesthetic was ether administered by the insufflation method of Meltzer and Auer. As there was much difficulty experienced in passing a catheter through the larynx, tracheotomy was resorted to as a preliminary in each case, and the catheter then passed directly into the trachea. Air was given with the ether in considerable quantity, and every few minutes the administration was stopped to allow the animal to breathe normally. Then the thorax was opened by an incision parallel to the ribs at the seventh interspace, left side, a self-retaining retractor inserted, and its blades separated widely. This exposed the thoracic viscera and gave ample freedom for the purpose in view. The lungs and heart were then pushed upward, and gauze inserted to keep them from the field. After cutting through the posterior layers of pleuræ, the esophagus was easily within reach from a point two inches above the diaphragm to the diaphragm, and the anterior vagus (the left) was then exposed. It was ligated with a coarse though soft cord, and rather less force exerted in tying than is used to tie off a medium-sized artery. The same process was undergone with the posterior vagus (right), the thoracic wound closed, catheter removed and trachea sutured, finally closing the neck wound. The thorax was tightly bandaged, the neck wound dressed, and the animal was left to recover.

Post-operative.—For a few days, the cats would take only milk and seemed under much shock, but gradually other food would be taken; so that by the end of a week or ten days they would eat meat and fish also. Of nine animals thus operated upon, one died of inanition after seven days, two directly after operation, and one of sepsis due to scratching off the neck bandage. The other five lived. In cats No. 1 and No. 2, only the left vagus was tied off; in the others, both vagi were ligated. All five animals gained weight, but acted rather sluggishly. They were killed at various times between 111 and 140 days after operation. In each case the animal was killed between five and six hours after a full meal. As controls, three well nourished animals were used. These were fed similarly to those operated upon and also killed 5–6 hours after a full meal. These are designated in the table as N1, N2, and N3.

Upon opening the abdomen in the operated animals, the most noticeable condition was the still full appearance of the stomach, and the hardness of the stomach walls. The large intestine also seemed unduly large in calibre and in length. In the thorax, below the ligature, the vagus seemed like a silver thread, about one quarter to one third the size of the portion above the ligature. Upon opening the stomach from cardia to pylorus it was found filled to its capacity with only slightly digested masses of meat, almost dry, and the various masses still discrete. In the normal cats, digestion had progressed until the mass was gelatinous, and the various particles thoroughly coated with gastric juice; and the walls were neither much distended nor hard. The next point of difference between the operated animals and the controls was in the thickness of the stomach wall. In the operated animals, this varied between two and three times the thickness of the normal one; and when the contents were removed, and the stomach collapsed, bands of muscular tissue showed plainly in its walls. The stomach felt tough and very thick and nodulated between the fingers, while in the controls, the walls were softer and more delicate and the fingers could appreciate objects through the thickness of the wall. The most marked change in gross appearance, however, was seen in the rugæ. As seen by the photographs, cats No. 1 and No. 3 have these rugæ standing out prominently in all directions—a very redundant mucous membrane, feeling much like a mass of worms, while in the control cat N1, they were longitudinal and orderly in arrangement, and easily smoothed out under slight pressure. As will be seen by the table, the colon also was larger and of greater calibre in all the cats operated upon than in any of the controls. These results agree in a measure with those of Schiff (9), who divided the vagi below the diaphragm. His animals thrived and fattened; from which however he drew the erroneous conclusions that no secretory nerves pass via the vagi to the stomach; in contradiction to which Pawlow (10) shows conclusively that stomach glands are activated by impulses from the vagi. The largely undigested condition of the stomach contents in our operated animals agrees with Pawlow's contention. Cannon (11) also states that in six hours a normal cat's stomach is usually empty but is delayed by division of vagi; which view agrees with our findings in vagus ligation. W. von Yzeren (12) states that after vagotomy the stomachs are hard and the pressure of the walls slightly increased—also in agreement with the present results. But none of these authors makes special mention of any increase in the size or thickness of the various coats of the stomach, especially of the increase of the glandular one. It is our belief that that marks the distinction between the results of vagotomy and a vagus pressure neuritis, such as is produced by this method.



All three photographs represent the everted stomachs of animals, No. 1, N1, No. 3. From the table, we see that cat No. 1 suffered ligation of only the left vagus, cat No. 3 of both vagi, and cat N1 was the control. The stomach was cut from the cardia to the pylorus, and simply everted and photographed (all three at the same exposure). The great redundancy of the mucous membrane in the operated animals is at once evident; there is even seen the excess of the rugæ in cat No. 3 over cat No. 1, and the disorderly arrangement of the rugæ.

Microscopically, the appearance of the stomach wall was distinguished from the normal, by the great excess of submucous areolar tissue, by the great bands of muscle fibers, both longitudinal and transverse, and by a marked increase of the convolutions of the mucous membrane and the number of the stomach glands. To properly estimate this latter increase, the following method was adopted—which was kindly suggested by Dr. W. G. MacCallum. Two stomachs, one of a control animal, were distended with 5 per cent. formalin solution, directly after killing the animals, at a pressure sufficient to flatten out the rugæ. At this pressure, which was recorded, the cardiac and pyloric ends were ligated and after being measured, the whole mass placed in a jar of 5 per cent. formalin. After a few days, the distention becoming permanent, small portions of various parts of both stomachs were cut out, and horizontal sections through the glands parallel to the stomach surface were made and stained with hematoxylin. These transverse sections of the gastric glands allowed of a comparatively easy count of the number of glands. Even without actual count, the number per field in the operated animal could easily be seen as increased over that in the control. The actual increase was estimated with the result as given in the table.

Cat No.	1	2	3	4	N1	N2	N3
Operation	Left vagus tied off.		Both vagi tied off.		——	——	——
Days killed after operation	111	151	109	100	——	——	——
Stomach wall	thick, large, hard, and resistant to pressure ; nodulated.				soft, thin, pliable, smooth and uniform.		
Mucous membrane	redundant ; many rugæ, irregular; (photograph).		still more redundant ; (photograph).		rugæ orderly and parallel ; not redundant; (photograph).		
Pressure to flatten rugæ	——	1,560 mm. water.	——	1,480 mm. water.	——	660 mm. water.	723 mm. water.
Colon, length	312 mm.	317 mm.	324 mm.	——	195 mm.	207 mm.	——
Colon, circumfer.	60 mm.	69 mm.	68 mm.	——	32 mm.	41 mm.	——

The pressures necessary to flatten out the rugæ were in the normal cat, N2, 660 mm. water and in operated No. 2 animal, 1,560 mm. The size of the stomachs when thus distended was for the normal animal, N2:

Greater curvature	250 mm.
Lesser curvature	85 mm.
Circumference	235 mm.
In the operated animal No. 2,	
Greater curvature	291 mm.
Lesser curvature	83 mm.
Circumference	242 mm.
In the control animal N2,	
Length of colon	207 mm.
Circumference	41 mm.
In the operated animal No. 2,	
Length of colon	317 mm.
Circumference	69 mm.

The glands in the transverse sections were counted in six separate fields and gave the following results (per sq. mm.):

Control N2.	Operated Animal No. 2.
353	420
299	466
284	501
300	393
296	408
302	440
1,834	2,628

giving an average of:

305 + per sq. mm.	438 per sq. mm.

The approximate estimates of the superficial areas of these stomachs are 19,539 sq. mm. and 22,627 sq. mm. respectively. This will give a total number of glands on the stomachs of cat N2 of 5,978,934 and of cat No. 2 of 9,910,626—a marked increase. The stroma between the glands was much diminished in the cat No. 2 as compared with the control animal, and the glands therefore placed more closely. The number of cells in each gland of both controls and operated animals was about the same. Other changes microscopically observed are not of interest in the present paper and so will not be recorded here.

In the colon there was produced both an increase in length and in calibre, with a corresponding increase in the number of follicles of Lieberkuehn. In this connection, we see a correspondence with the conditions presented in Hirschsprung's disease (giant colon) for which many causes have heretofore been ascribed; thus (1) congenital, (Hirschsprung, Concetti, Duval et al.); (2) congenital dilatation plus mechanical and inflammatory changes and hypertrophy (Genersich); (3) stoppage and decomposition of intestinal contents (Marfan, Griffith, Frommer); (4) valves, folds and crevices causing stagnation, dilatation and hypertrophy (Perthes, Marchand); (5) volvulus of the flexure (Frommer, Barth); (6) spasm of sphincter ani (Fenwick, Wilms, Bertelsman).

To produce the dilatation of the colon without producing an effect upon the stomach, it is possible that some of the vagus filaments below the stomach are compressed without a corresponding pressure on the respective sympathetic fibers. It seems likely therefore that in the pathogenesis of Hirschsprung's disease, a pressure neuritis on the terminal vagi fibers may be found to play an important rôle.

We then see that a pressure, long continued, upon the vagus below the esophageal plexus, will produce in the stomach an actual cell increase in the mucous membrane of that organ. This increase of the number of cells is, however, not coincident with an increase in their functional activity as we have seen, but in a diminished activity or perverted function. In other words, the trophic control over the gastric cells,—that having to do with their growth and reproduction,—was excessively stimulated; the control of their functional activity and that of the stomach as a whole,—the production of the gastric juice, the expulsion of the contents from stomach to intestine—was greatly in abeyance.

The supposition, therefore, of the nerve current passing in the circuit of the sympathetic,—the solar plexus and the splanchnics—in increased quantity as a result of the partial closure of the vagus path, and causing increased activity in those centers, with diminished vagus activity, is supported by the results obtained in these experiments. (Do these results perhaps also explain so-called vagus inhibition?)

Can we deduce possibly other far-reaching effects from our results? Can we say that a long-continued pressure upon some one mixed nerve, containing both sympathetic and central fibers, if acting unequally upon these fibers, producing greater pressure effects upon the cerebrospinal ones than upon the sympathetic;—can we say that such a pressure will produce on the cells of the tissue to which the nerve trunk is accredited an activity resulting in their numerical increase producing a true hyperplasia with a diminished or perverted function? If so, have we not in such a pressure one of the factors in the production of neoplasms?

In conclusion, I beg to acknowledge my indebtedness for many valuable suggestions, and for actual assistance in my experiments, to Dr. W. G. MacCallum, who also kindly allowed me the use of the Pathological Laboratory at the College of Physicians and Surgeons, and to whom I herewith tender my thanks and appreciation; also to Dr. Pearce Bailey, of the Neurological Institute, whose stimulating criticisms aroused the necessary energy to prosecute the work; and finally to Miss Laura Stryker, of the Pathological Department of Columbia University, who kindly undertook to prepare the microscopic material for me.

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Society Proceedings

PHILADELPHIA NEUROLOGICAL SOCIETY

December 20, 1912

The President, Dr. John H. W. Rhein, in the Chair

SPINAL MUSCULAR ATROPHY LIMITED TO ONE SEGMENT OF A LIMB

By Alfred Gordon, M.D.

A boy of 16 noticed about four years ago that while walking his right knee would suddenly bend and he would have to stop for fear of falling. As the condition persisted, he began to examine himself. He then noticed a gradual diminution of size of the right thigh.

At present there is a marked wasting of the quadriceps group of muscles of the thigh. The right patellar tendon reflex is lost. The sensations are preserved. The electrical stimulation shows marked diminution of response to faradism and R. D. in the lowest portion of the quadriceps muscle. The power of the thigh is only diminished, but not lost. He has some difficulty while walking upstairs. The station is good. No history could be obtained as to a trauma or an infectious process. The Wassermann test is negative. In view of the progressive muscular atrophy with reactions of degeneration an old attack of acute anterior poliomyelitis could be thought of in spite of a negative history. The acute onset may have been overlooked, as it not infrequently happens in mild cases of acute poliomyelitis. The lesion is evidently limited to the right side of the third and fourth lumbar segments of the spinal cord.

Dr. Cadwalader said that he had frequently examined the patient presented by Dr. Gordon when he was in Dr. Sinkler's service at the Orthopedic Hospital. The history obtained at that time was that the atrophy of the thigh had begun when the patient was 7 years old, and that at the same time the muscles of the back were affected, so that lordosis was evident. There was also some indication of hypertrophy of the calf muscles. The fibrillary tremors were absent. A positive Wassermann reaction had been obtained four different times and the patient's mother had also given a positive Wassermann reaction three different times. These observations were certainly correct. Particular pains had been taken in carrying out these tests. They were all made by Dr. Corson-White at intervals of a month or more, using different technics, and special precautions were taken against error. The case is certainly not one of the usual type of progressive spinal muscular atrophy. The lordosis and the atrophy confined to the proximal portion of one extremity and the hypertrophy of the calf muscles certainly indicate a common type of pseudo-muscular hypertrophy. What relation hereditary syphilis might bear to the development of dystrophy is uncertain, yet positive Wassermann reactions are not rarely obtained in patients with this disease.

Dr. Gordon said that the Wassermann reaction in his case was negative on repeated examination by a competent serologist. In view of this fact, also in view of totally negative history of infection in the family, in view of the fact that the affection according to the patient has been in existence but five or six years, finally considering the tender age at which the affection made its first appearance, Dr. Gordon does not consider the case as syphilitic. It seems to him more plausible to view it as a case of an acute anterior poliomyelitis the prodromal symptoms of which had been overlooked as is frequently the case.

A CASE OF PSEUDOSCLEROSIS; PRESENTING TREMOR, SPASTICITY AND CONTRACTURE

By Williams B. Cadwalader, M.D.

W. P., 36 years old; father is healthy; mother melancholic; one brother healthy; one older sister and two brothers are suffering from a condition similar to that presented by this patient, namely, tremors, rigidity, spasticity and contractures, beginning in youth. One affected brother is mentally deranged, the other brother and sister are normal mentally. This patient, as well as the affected members of his family, was born at full term and developed normally. The present condition began when he was 16 years old. He first noticed tremor beginning in the right hand and arm with increasing rigidity and spasticity which gradually spread, involving the whole body. At the same time he had bleeding of the gums and loss of teeth. He now presents a condition evidently due to a disturbance of the motor system which began in youth, similar to that of the other members of the family. It does not seem to be congenital, neither does it seem to be hereditary. It is characterized by involuntary movements of the nature of tremor, two or three oscillations per second, which increase under emotion and by voluntary effort, but do not disappear when at rest. The tremor is general, involving the muscles of the face, particularly of the lower jaw, neck and upper extremities, almost every group of muscles in the entire body being more or less affected. Dysarthria is pronounced, but his speech is not scanning in character. Spasticity or rigidity of the muscles is very marked in the trunk and also contractures. The latter are not, however, permanent. True motor paralysis is absent or very slight. His disability seems to be due entirely to tremor, rigidity and apparent incoördination and not due to paralysis. All the tendon reflexes are exaggerated, but equally so. The abdominal and cremasteric reflexes are normal. Bilateral Babinski sign has been obtained, but is not constant and somewhat uncertain. Mentally he has always been normal and is still so. The disease at first was progressive, but became stationary during the fifth or sixth year after onset. Further examination has shown nothing abnormal.

Eyes normal, no nystagmus; sensation normal. Wassermann and Noguchi reactions negative. No convulsions. The thoracic and abdominal organs are normal, no paresthesia, no ataxia. Except for his inconvenience the patient feels well.

The possibility of progressive lenticular degeneration like that described by Wilson has been considered, but on account of the presence of the

Babinski sign, the absence of mental deterioration, the long duration without progression, this diagnosis would seem improbable. Multiple sclerosis has been excluded on account of the absence of nystagmus, and changes of the optic nerves and the absence of the scanning character of speech, and the absence of motor and sensory paralysis. The fact that the disease is familial, the character of the tremor, the rigidity and contractures with no paralysis, and the gingivitis and loss of teeth led Dr. Cadwalader to believe that the diagnosis of pseudosclerosis might be justified, even though there is no mental disturbance. Strümpell and Frankl-Hochwart both emphasized the early and progressive dementia in their cases. Fickler's cases were familial. The disease described by Oppenheim and called by him " dysbasia lordotica progressiva " would appear to be somewhat similar to the condition presented by this patient.

Dr. Dercum stated in regard to Dr. Cadwalader's case that it was one which properly belonged to the group which has been called "pseudosclerosis." The symptoms are evidently not those of either tic convulsif, on the one hand, or multiple cerebrospinal sclerosis on the other, and while the term pseudo-sclerosis is in itself objectionable, still there does not seem to be another name which suggests itself at present for these cases.

Dr. J. Hendrie Lloyd said that Dr. Cadwalader's patient seemed to him to present a very anomalous condition. He did not know what to call it, but he confessed that he did not like the term pseudo-sclerosis. Whatever it was, it was a genuine, not a pseudo-affection. Those rare forms of motor affection are very perplexing. The present case reminded him somewhat of the case of a woman who has been in Blockley for some years, and who has an extraordinary form of tremor and incoördination which has puzzled many observers, and does not conform well to any recognized type.

Dr. Cadwalader said that he thoroughly agreed with Dr. Lloyd and Dr. Dercum. The term pseudo-sclerosis is confusing and most unsatisfactory, but that he had used that title to indicate a clinical picture which was described under that name by Strümpell, Westphal, Frankl-Hochwart and others. This case he thought belonged to that group, the pathology of which seems to be unknown. Whatever the case may be it is certainly not one of multiple sclerosis.

Dr. Charles W. Burr reported a case with brain symptoms three months after syphilitic infection. He also presented a case with symptoms of tetany and one with acromegaly.

Dr. Alfred Gordon asked Dr. Burr whether Chvostek's sign was present in his case of tetany. He also asked to know the electrical reactions of the muscles affected. As calcium salts have been recorded to be of some benefit in cases with tetanic contractions because of a certain rôle the parathyroids play in affections with tremors according to the researches of MacCallum and Voegtlin, Dr. Gordon wished to know whether Dr. Burr's patient was kept on that treatment.

Dr. Lloyd said that this patient had formerly been under his care at Blockley. He had, he thought, been the first to elicit the peculiar tetanic spasms on pressure over the nerve trunks. He had also mapped out the areas of anesthesia. Considering the irregular distribution of the symptoms, and their tendency to come and go, he was inclined to regard the case as one of hystero-neurosis, of a very unusual form.

In regard to Dr. Burr's case of early nervous syphilis, Dr. Dercum recalled that he had exhibited before the Society many years ago a patient who presented at the same time the surface lesion of secondary syphilis and a recent hemiplegia. Early nervous syphilis, while rare, does, of course, occur.

Dr. Burr's case of acromegaly is an exceedingly typical case, classical in its symptoms. The mental condition which seems to be that of a dementia with confusion is very suggestive. These symptoms, which are pronounced in Dr. Burr's case, are often present in acromegaly, but as a rule in a degree so slight that they often escape recognition.

Dr. Lloyd said the case seemed to him to be one of dyspituitarism. This was shown not only by the pronounced acromegalic syndrome but by certain other features, such as the headaches and nose-bleed, and by the retrogression in sexual development.

Dr. J. Hendrie Lloyd read a paper on "Confusional Psychosis Following a Castration for Tuberculous Testicles."

NEURASTHENIC-NEUROPATHIC INSANITY

By F. X. Dercum, M.D.

The patient is a woman, 51 years of age, who gives a negative family history; also a negative personal history up to four years ago. At that time she states that she had a great deal of illness in the family and was obliged not only to nurse but to do the housework at the same time. She went for long periods of time without sleep and finally became utterly exhausted. She noticed one day a small fragment of some hard substance at the base of her teeth in the lower jaw. She does not know what it was, but in reply to questions says she thinks it may have been a loose piece of tartar. She says that she expectorated this fragment, but since that time other fragments have been making their appearance constantly. Now they are not hard but soft. They are white and flaky and they come in enormous number, so much so that she is constantly obliged to work her mouth as though in the act of chewing and to make efforts at swallowing to keep these particles from choking her. Some months after the trouble first began, she consulted a dentist who removed first the teeth in the lower jaw, then the symptoms persisting, all the teeth of the upper jaw; substituting artificial teeth in both instances. However, the chewing and swallowing movements persisted. She then had both of her tonsils removed, which also failed to give her relief, and the movements have continued up to the present day. The patient is constantly grinding her plates together, jaws and tongue are moving ceaselessly, only to be interrupted now and then by an effort at swallowing. She brings with her a small vial containing saliva in which there may possibly be seen a few minute whitish flakes of mucus or epithelium. She states that she is obliged to keep awake at night; that if she sleeps more than two or three hours at a time these white particles accumulate in such number as to choke her and she knows that if she did not awaken she would die from this cause.

The general physical examination of the patient is negative. She is nervous and presents a number of the usual subjective symptoms of neurasthenia. She tires very readily, becomes nervous upon slight provocation and also suffers from various fatigue sensations.

The case illustrates in a typical manner the true elements which enter into a neuropathic-neurasthenic insanity, a psychasthenia so-called. The

French originally applied to this group of affections the term neurasthenic insanities and later, as we know, Janet devised the term psychasthenia. The major element in such a case is doubtless a neuropathy, a neuropathy which is very likely inherent. It is probable that the family histories which we get in cases of this kind as in others, are unreliable as regards the existence of functional nervous and other disturbances. This woman appears to have conducted herself in a rather normal manner until subjected to the very unusual and persistent nervous strain which she describes. We have therefore a neuropathy to which has been added the factor of exhaustion, the result being the evolution of the peculiar symptoms which this patient presents. In other respects the patient appears to be normal. She is not delusional concerning any other matter, and gives a lucid account regarding her daily life and surroundings.

NEW YORK NEUROLOGICAL SOCIETY

February 4, 1913

The President, Dr. Smith Ely Jelliffe, in the Chair

TUMOR OF THE BASE OF THE BRAIN IMMEDIATELY BEHIND THE PITUITARY BODY

By H. Climenko, M.D.

The patient was a girl, nine and a half years old, of Jewish parentage, born in the United States, who first came under observation on November 10, 1912. The family history was unimportant. Personal history: The patient was delivered instrumentally and breast fed. Teething occurred in the seventh month, and she began to speak and walk when about a year old. She attended school until her present illness, and was of average intelligence. She had whooping cough at the age of four years and measles a year later.

Present Illness.—For the past twelve months the child had suffered from unusual thirst and occasional vomiting, although these symptoms were not of sufficient severity to interfere with her regular school work. The attending physician had not found anything abnormal in the urine. About six weeks ago she developed an alveolar abscess of a right lower molar; the abscess was incised, and a few days later the tooth was extracted. On the following day, ptosis of the right eyelid was noticed, and two days later a similar condition developed on the left side. She began to suffer from intense headaches and profuse vomiting.

Examination by Dr. Climenko showed a pale emaciated child of normal size and good development Her station and gait were negative. All the tendon reflexes were increased; no Babinski; no clonus. The abdominal reflexes could not be elicited. No sensory disturbances. Smell was unaffected. There was complete bitemporal hemianopsia, with pallor of the optic discs. There was complete ophthalmoplegia of the left eye, and the right eyeball was drawn outward. Both pupils were widely dilated and failed to react to light and accommodation: the other cranial nerves revealed no abnormalities. The heart, lungs and abdominal viscera were negative.

With the above symptoms, the following possibilities as to diagnosis were thought of: (1) A toxic neuritis of the ocular and optic nerves. (2) An empyema of the body of the sphenoid. (3) An encephalitis of specific origin. (4) Tumor. The patient was admitted to the Mt. Sinai Hospital, where she was seen by Dr. I. Abrahamson. The blood and spinal fluid were examined with negative results as to the Wassermann test. An X-ray examination, made by Dr. L. Jaches, showed a marked depression of the middle fossa of the skull, presenting a trough-like appearance, while the posterior clinoid process was pushed forward, narrowing the upper part of the sella turcica. With these findings, the diagnosis of a tumor of the base of the brain was established.

This patient, Dr. Climenko said, was at present in the Neurological Hospital on Blackwell's Island. The headaches and vomiting had disappeared completely for the past few weeks, but the child was extremely emaciated and totally blind. No other symptoms had developed.

Dr. I. Abrahamson said the case reported by Dr. Climenko was first looked upon as one of toxic ophthalmoplegia, with beginning atrophy of the disks. A little later, when the atropine had worn off, it was noted that the pupils remained widely dilated, did not contract to light, etc., and they then knew that they were dealing with a condition directly involving the nerves themselves. The X-ray cleared up the diagnosis, revealing a tumor behind the sella turcica.

A CASE FOR DIAGNOSIS

By H. Climenko, M.D.

A married woman, 46 years old; born in Russia. The only point of interest obtainable in the family history was that the mother and two sisters were "very nervous." The patient's previous history was negative. She passed the menopause two years ago.

When the patient was first seen by Dr. Climenko, six years ago, she gave the following history: Two years ago she was awakened one night with a peculiar sensation in the right upper extremity; she felt as though a shock of electricity had passed from her shoulder to her toes. This lasted only a few minutes, and after that she was unable to move the right upper extremity; it hung powerless by her side for a few minutes only, soon afterwards assuming its normal function, and on the following day she was able to work.

Two months later she had a similar attack, but this was of longer duration. Since then these attacks became more frequent and lasted for a longer time. She consulted a physician, who advised hypodermic injections of strychnia, with massage and electricity. This treatment, the patient claimed, aggravated her condition, and subsequently she complained of weakness and inability to use the right arm.

Physical examination revealed a hypertrophy of all the muscles of the right upper extremity. The reflexes were unchanged; there were no sensory disturbances; no change in the electrical reactions. There was diminution of the gross motor power in the arm and inability to execute the finer movements (picking up a pin; threading a needle, etc.) with the right hand. No other symptoms were present.

Six years later, when the patient again consulted Dr. Climenko, she complained of total disability of the right upper extremity, with paresthesias and tonic contractions in the flexors of the arm on attempting to flex the forearm. A physical examination at this time showed enormous hypertrophy of all the muscles of the right upper extremity, but particularly of the flexors of the forearm. The right upper extremity was one inch larger than the left. The electrical tests showed a normal nerve reaction but a remarkable hyperexcitability to both galvanic and faradic currents, without any qualitative change. There were myotonic contractions of the biceps at each attempt to flex the forearm, either actively or passively. Direct myotonic irritability was increased and fibrillary twitchings were present in the flexors of the forearm. There were no sensory disturbances. There was weakness of the entire right upper extremity, and inability to use the hand. There were no other nervous symptoms. The blood pressure was 150 mm. The heart and lungs were normal; the urine negative, as was also an X-ray examination of the spine and upper extremities.

Dr. Abrahamson said the case shown by Dr. Climenko was very unique. The enlargement of the right upper extremity had now persisted for six years, and both the bones and muscles, skin and integument, were involved, and in addition to this, there was a distinct myotonia. The speaker said the case appealed to him as an unusual type of syringomyelia, a syringomyelia myotonica cum macrosomia with the involvement of two distinct cord areas, producing both a myotonia and a macrosomia. There was also a slight enlargement of the right face, the right side of the forehead being more prominent than the left. Frankl-Hochwart many years ago called attention to a syringomyelia with intentional spasms; but here distinct myotonia was absent.

AIR IN THE VENTRICLES OF THE BRAIN FOLLOWING A FRACTURE OF THE SKULL

By W. H. Luckett, M.D.

The patient was a machinist, a white man, 47 years old, who was admitted to the Harlem Hospital on November 24, 1912, shortly after he had been struck by a trolley-car and thrown to the pavement. On admission, he was conscious and rational. The pupils reacted equally to light. There was a right subconjunctival hemorrhage. There was a lacerated wound over the right eyebrow, connecting with a circular fracture of the frontal bone just above the orbital ridge. The tongue was covered with a bloody fluid, probably cerebro-spinal fluid. A diagnosis of fracture of the skull was made and confirmed by two X-ray plates by Dr. W. H. Stewart. The patient was prepared for immediate operation, but his symptoms cleared up so rapidly that it was decided to wait. On the fourth day he was sitting up in bed; on the seventh he was out of bed, and five days later he left the hospital contrary to advice and under protest.

One week later, on December 12, 1912, he was readmitted with the history that two days previously he had a severe headache, with occasional vomiting. Up to that time he had been reading the papers daily, although he was dull and listless and would not converse with anyone, and took no notice of his surroundings. For the past few days he had not replied when spoken to, although he understood what was said to him.

Two days after his readmission to the hospital the patient was examined by Dr. William M. Leszynsky. At this time the man was conscious; he answered questions and obeyed commands intelligently; cerebration was slow and he was inclined to lapse from time to time into a condition of mental confusion; there was no aphasia at this time; no disturbance of speech; no astereognosis; tremor of tongue and hands. The pupils were normal and reacted equally. Facial innervation and motility of the tongue were normal. No tenderness on percussion over skull. No rigidity of neck. Upper extremities normal: the lower extremities showed no paresis nor rigidity, but were resistive to examination. Both knee jerks were increased, especially the right. Diagnosis, increased intracranial pressure; probably abscess.

A blood count, made on December 15, showed 15,900 leucocytes, with 86 per cent. of polymorphonuclears and 8 per cent. of lymphocytes. An ophthalmoscopic examination, made on the same day by Dr. M. Cohen, showed that the external ocular muscles of both eyes were normal, with a slight subconjunctival hemorrhage in the right temporal quadrant. In the right fundus, the veins were enlarged and tortuous, with the central vein markedly dilated over the disc and also at the exit from the nerve. The arteries were slightly contracted. The disc borders were indistinct, due to marked edema. In the left fundus the veins were also markedly dilated; the arteries were contracted, the disc borders were indistinct and there was a suspicion of retinal hemorrhage. Diagnosis, bilateral optic neuritis indicative of intracranial pressure.

A second series of X-ray pictures taken by Dr. Stewart showed that the ventricles of the brain were enormously dilated with what was probably either air or gas, and the patient apparently getting worse, a right-sided subtemporal decompression was done by Dr. Luckett on December 16. Upon exposure, the dura did not bulge and was not particularly tense. No fluid escaped on incision of the dura and pia; a slight meningitis was noted. A needle was then passed into the anterior horn of the lateral ventricle, and the removal of the trocar was followed by two or three quick spirits of air and fluid, and then clear cerebrospinal fluid to the amount of eight c.c.

Because of the presence of a slight meningitis, the large quantity of fluid and the presence of air in the ventricles, it was determined to drain the ventricles. The patient was now turned over on his face, and a suboccipital operation was performed. The bone was exceedingly thin. The dura was incised, and then the pia into the cisterna magna, and immediately there escaped considerable clear fluid, generously admixed with bubbles of air. A small piece of twisted rubber tissue was inserted as a drain. The patient did well until the fourth day after the operation, when his temperature suddenly went up to 107 and he died.

At the autopsy, which was performed by Dr. Otto H. Schultze, air was shown to be present in the ventricles when they were incised with the brain submerged in a vessel of water. There was a lacerated wound of the base of the right frontal lobe just beneath the right anterior horn and just over the fracture in the orbital plate that communicated with the frontal sinus. It was subsequently learned that air was probably forced up through the fracture in the frontal sinus into the ventricles during an attack of sneezing.

In connection with this case, Dr. Luckett exhibited a number of radiographs demonstrating the presence of the air in the ventricles of the brain.

Dr. William M. Leszynsky, who had made an examination of the patient before the operation, said he had found it impossible to determine the cause of the intracranial pressure, although he was inclined to the view that the patient might be developing a cerebral abscess. This idea was dispelled, however, by the X-ray plates, which showed a very unique picture; unlike anything, so far as he knew, that had ever been recorded.

SOME ANOMALOUS TREMORS

By Smith Ely Jelliffe, M.D.

Two patients were shown to illustrate some anomalous types of tremors. They were from Dr. Hammond's and Dr. Jelliffe's service at the Post Graduate Hospital. The first patient was a woman, 29 years old, with a tremor of the left hand which was continuous during the day, disappearing during sleep. The tremor had come on gradually about seven months previously. Its rate was from 5.6 to the second; had little intention quality. There was also a slight inequality in the pupils, but no modification of the reflexes. Negative Wassermann and negative throughout otherwise. The eyegrounds were normal.

The second patient, a woman, 34 years old, had a tremor which began 16 years previously in a manner very similar to that illustrated in the first case. It began in one hand and gradually became generalized, until now it involved almost the entire body. There was marked stiffness and a tendency to retropulsion at times. There were no palsies nor sensory changes, excepting that the sole of the left foot showed a slight diminution to light touch. All the reflexes were fairly active; there was no distinct Babinski. The eyes showed a slight inequality of the pupils, which was also present in the first case, and a very distinct pallor of the temporal side of both discs. The fields were normal; there was no nystagmus. There were no speech defects. The patient was a sensible, intelligent young woman, and careful psychanalysis by Dr. Beatrice Hinkle failed to show any complex constellations. She had gradually lost weight, but there was no appreciable diminution in muscular power.

Dr. B. Sachs said he regarded the first case as one of paralysis agitans and the second one a multiple sclerosis. The first case he thought was absolutely typical of paralysis agitans: there was no other type of tremor that it could be mistaken for, and the only one that could be at all compared to it was an occasional functional tremor. The speaker said he recalled one such case where the husband had paralysis agitans and the wife developed a very similar functional tremor. In the case shown by Dr. Jelliffe the woman had the facies of paralysis agitans, and had no symptoms which would lead one to think of any other diagnosis. As to her age, 29 years, that would not necessarily militate against the diagnosis, as paralysis agitans may have its onset in early life. The speaker said that in his book he had recorded a case of paralysis agitans in a young man coming on about the age of 18 or 20; in that case the patient eventually developed all the symptoms of a disseminated sclerosis, although at their onset they were quite characteristic of paralysis agitans.

As to the second case, Dr. Sachs said he thought there was no doubt that it was an example of multiple sclerosis. The woman had a tremor which became worse on exertion, and she had just a slight tremor—an unconscious tremor we might call it—of the head and neck muscles which we did not see in paralysis agitans. This was very significant of multiple sclerosis. She also had a pallor of the optic discs and some monotony of speech.

Dr. Abrahamson, speaking of Dr. Jelliffe's second case, said it reminded him of a girl who was a patient at the Montefiore Home, excepting that that patient was somewhat spastic. He thought, however, it belonged to the same category. In these cases we probably had to deal with a diffuse lesion in the midbrain in the nucleus ruber and the crus, and very likely involvement of the rubro-spinal system.

Dr. J. Ramsay Hunt said that in the first case shown by Dr. Jelliffe, on passive motion, there could be elicited a slight interrupted rigidity of the muscles. This was a phenomenon to which Dr. Moyer had applied the name of the "cog-wheel" symptom of paralysis agitans, and in early cases the speaker thought it was of distinct value—these slight interruptions on making passive movements.

As to the second case, Dr. Hunt thought a positive diagnosis could not be made. That offered by Dr. Sachs would be a probable working one; at the same time the speaker said he was inclined to regard it as a case of progressive degeneration; perhaps, as Dr. Abrahamson had suggested, in the pyramidal tracts.

Dr. Leszynsky said the unusual factor in the first case shown by Dr. Jelliffe was the age of the patient. The character of the tremor was not at all unusual, as the speaker said he could recall perhaps half a dozen cases where it was unilateral, being confined to one hand for many months. When the patient's attention was directed to the opposite hand, the tremor on the affected side increased, which was quite characteristic in paralysis agitans.

As to the second case, Dr. Leszynsky said he did not think much stress could be laid upon pallor of the discs, as ophthalmologists frequently differed in their view of its significance—whether it was pathological or physiological. In this case there was apparently no disturbance of the field of vision. Personally, he would favor the diagnosis of paralysis agitans.

Dr. Edward D. Fisher said he had seen a case very similar to the first one shown by Dr. Jelliffe, where there was evidently a lesion in the crural tract, but in the case he had in mind the tremor was constant and increased on motion. As to the second case, Dr. Fisher said he would be inclined to look upon it as a paralysis agitans rather than a multiple sclerosis.

Dr. B. Onuf suggested that in the second case there might be a diffuse brain sclerosis instead of a multiple sclerosis.

Dr. L. Pierce Clark said the two cases shown by Dr. Jelliffe impressed him very much as they had Dr. Sachs and for the same reasons. He was surprised to hear from the discussion that paralysis agitans should be looked upon as such an entity, and he thought it was rather premature to insist upon an anatomical basis for that disease.

In the first case, the tests showed that there was a distinct alteration of the vibrations to the intention type of tremor. He thought this was a case of paralysis agitans, while the second was one of disseminated sclerosis. The speaker said he saw a case of paralysis agitans at the Vanderbilt Clinic in a man 29 years old, although these patients look older on account of the mask-like expression of the face.

Dr. Sachs said he had never seen a rapid tremor that he could account for by any midbrain lesion.

Dr. Jelliffe, in closing, said these two cases were shown for the express purpose of bringing out such a discussion as had been elicited. He felt that one was justified in inferring that both cases were of a similar type, and that the first case represented the beginning stage of what might ultimately develop into the condition of the second case. He was inclined to believe that in both cases the process was one of multiple sclerosis, but one which was localized at first and primarily in the midbrain structures. Here we had midbrain, or paralysis agitans, types of multiple sclerosis, the multiple sclerotic area involving those pathways which in the more recent works on this subject were referred to as being involved in paralysis agitans.

As to the character of the tremor, Dr. Jelliffe said at least three definite types of tremor originating in the midbrain structure, depending on the point of interruption of the mechanism, were to be distinguished. These were the athetoid, the paralysis agitans like, and the intentional tremor. From the more recent studes of this subject we were able to say in just what portion of the arc the mechanism was interrupted.

In both of the cases he had shown, Dr. Jelliffe said, the tremor was like that of paralysis agitans. The presence of vaso-motor signs indicated possibly the implication of the thalamus, while the eye signs pointed to lesions located near the red nucleus. An anomalous type of Wilson's disease was to be thought of.

ADDRESS OF THE RETIRING PRESIDENT

By L. Pierce Clark, M.D.

Dr. Clark, in retiring from the presidency, briefly sketched the work of the Society during the past two years and emphasized the importance of giving more attention in the future to the beginning neuroses and psychoneuroses, the milder forms of the frankly established psychoses, and more especially to the causation and treatment of such. He felt sure that if this plan were more generally followed, the discussions of the papers would take on a broader and deeper trend. He also suggested that the case presentations be made more thorough, and that some provision be made, if possible, for those members who were interested to look over the clinical material before the general discussion was called for in open meeting.

A SUMMARY OF THE ORIGINS, TRANSFORMATIONS AND PRESENT DAY TRENDS OF THE PARANOIA CONCEPT

By Smith Ely Jelliffe, M.D.

Dr. Jelliffe made this the subject of his presidential address, giving a historical review of the subject of paranoia. After referring to the antiquity of the term paranoia, which was even pre-Hippocratic, he rapidly sketched the varying concepts of the condition from the time of Celsus and Aretaeus, through the long periods of the medicine of the monasteries, the later work of Plater, Vogel, Plocquet, Pinel and Heinroth (1808), where one found the first approach of that century old discussion, the chief reverberations of which still linger in present day psychiatry. The concepts given in the text-book of Krafft-Ebing represented the full bloom of the paranoid period, and his picture was all too recent to need much elaboration. The speaker then referred to the more recent work by Kraepelin and Freud, and expressed the hope that his review of the subject would serve to orient the present traveller as to the drift of opinion today relative to the paranoia question. It was almost trite to say that with each new generation, newer methods of solving old problems arose, and that refinements in methods of analysis with sounder syntheses resulted. Old lines faded away, new boundaries were run and radical rearrangements were everywhere apparent. This was as it should be; it was an indication of healthy mental activity, and in no field of psychiatry was this forward push more apparent than in the consideration of the paranoia domain. Seen from one point of view, the trend of development seemed to be tending towards an elimination of the concept entirely. Like the famous snakes in Ireland—so with paranoias, one might almost say that "there were none." On the other hand, another present day trend pointed in the direction of the unravelling of some most fascinating and highly important mental mechanisms which played a large rôle in the psychopathology of everyday life. The paranoid character, if he might so call it, promised to offer a clue to the further elucidation of many important situations, not only of mental pathology, but of many so-called normal reactions. This paper appears in full in the N. Y. Medical Record, April 5, 1913.

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

of vienna

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(*Continued from p. 269*)

Kyros

The sequel of this apparently more primitive report agrees essentially with the relation of Herodotus.

An altogether different version of the Kyros myth is extant in the report of a contemporary of Herodotus, Ktesias, the original of which has been lost, but is replaced by a fragment of Nikolaos of Damaskos.[37] This fragment from Nikolaos summarizes the narrative of Ktesias, which comprised more than an entire book in his Persian history. Astyages is said to have been the worthiest king of the Medes, after Abakes. Under his rule occurred the great transmutation through which the rulership passed from the Medes to the Persians, through the following cause: The Medes had a law that a poor man who went to a rich man for his support, and surrendered himself to him, had to be fed and clothed and kept like a slave by the rich man, or in case the latter refused to do so, the poor man was at liberty to go elsewhere. In this way a boy by name of Kyros, a Mard by birth, came to the king's servant who was at the head of the palace sweepers. Kyros was the son of Atradates, whose poverty made him live as a robber, and whose wife, Argoste, Kyros' mother, made her living by tending the goats. Kyros surrendered himself for the sake of his daily bread, and helped to clean the palace. As he was diligent, the foreman gave him better clothing, and advanced him from the outside sweepers to those who cleaned the interior of the king's palace, placing him under their superintendent. This man was severe, however, and often whipped Kyros. He left him and went to the lamp-lighter, who liked Kyros, and approached him to the king, by placing him among the royal torch bearers. As Kyros distinguished himself also in his new position, he came to Artembares, who was at the head of the cup bearers, and himself presented the cup to the king. Artembares gladly accepted Kyros, and bade him pour the wine for the guests at the king's table. Not long afterwards, Astyages noticed the dexterity and nimbleness of Kyros' service, and his graceful presentation of the wine cup, so that he asked of Artembares whence this youth had come who was so skillful a cup bearer. "O Lord," spake he, "this boy is thy slave, of Persian parentage, from the tribe of the Mards, who has surrendered himself to me to make a living." Artembares was old, and once on being attacked by a fever, he prayed the king to let him stay at home until he had recovered. "In my stead, the youth whom thou hast praised will pour the wine, and if he should please thee, the king, as a cup bearer, *I, who am an eunuch, will adopt him as my son.*" Astyages consented, but the other confided in many ways in Kyros *as in a son.* Kyros thus stood at the king's side, and poured his wine by day and by night, showing great ability and cleverness. Astyages conferred upon him the income of Artembares, as if he had been his son, adding many presents, and Kyros became a great man whose name was heard everywhere.

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[37] Nicol. Damasc. Frag. 66, Ctes.; Frag. Pers., 2, 5.

Astyages had a very noble and beautiful daughter,[38] whom he gave to the Mede Spitames, adding all Media as her dowry. Then Kyros sent for his father and mother, in the land of the Medes, and they rejoiced in the good fortune of their son, and *his mother told him the dream which she had at the time that she was bearing him,* while asleep in the sanctuary as she was tending the goats. *So much water passed away from her that it became as a large stream, inundating all Asia, and flowing as far as the sea.* When the father heard this, he ordered the dream to be placed before the Chaldeans in Babylon. Kyros summoned the wisest among them, and communicated the dream to him. He declared that the dream foretold great good fortune to Kyros, and *the highest dignity in Asia;* but Astyages must not learn of it, " for else he would disgracefully kill thee, as well as myself the interpreter," said the Babylonian. They swore to each other to tell no one of this great and incomparable vision. *Kyros later on rose to still higher dignities, created his father a Satrap of Persia, and raised his mother to the highest rank and possessions among the Persian women.* But when the Babylonian was killed soon afterwards by Oebares, the confidant of Kyros, his wife betrayed the fateful dream to the king, when she learned of Kyros' expedition to Persia, which he had undertaken in preparation of the revolt. The king sent his horsemen after Kyros, with the command to deliver him dead or alive. But Kyros escaped them by a ruse. Finally a combat took place, terminating in the defeat of the Medes. Kyros also conquered Egbatana, and here the daughter of Astyages and her husband Spitames, with their two sons, were taken prisoners. But Astyages himself could not be found, for Amytis and Spitames had concealed him in the palace, under the rafters of the roof. Kyros then ordered that Amytis, her husband, and the children should be tortured until they revealed the hiding place of Astyages, but he came out voluntarily, that his relatives might not be tortured on his account. *Kyros commanded the execution of Spitames,* because he had lied in affirming to be in ignorance of Astyages' hiding place; *but Amytis became the wife of Kyros. He removed the fetters of Astyages,* with which Oebares had bound him, *honored him as a father,* and made him a Satrap of the Barkanians.

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[38] This daughter's name is Amytis (not Mandane) in the version of Ktesias.

A great similarity to Herodotus' version of the Kyros myth is found in the early history of the Iranese royal hero, Kaikhosrav, as related by *Firdusi,* in the Sâh-nâme. This myth is most extensively rendered by Spiegel (Eranische Altertumskunde, I, 581 et seq.). During the warfare of King Kaikans of Baktria and Iran, against King Afrâsiâh of Turan, *Kaikans fell out with his son, Siâvaksh,* who applied to Afrâsiâh for protection and assistance. He was kindly received by Afrâsiâh, who gave him his daughter Feringis to wife, on the persuasion of his Wesir, Pirân, *although he had received the prophecy that the son to be born of this union would bring great misfortune upon him.* Garsivaz, the king's brother, and a near relative of Siâvaksh, calumniates the son-in-law, and Afrâsiâh leads an army against him. *Before the birth of his son, Siâvaksh is warned by a dream, which fore-*

told destruction and death to himself, but royalty to his offspring. He therefore flies from Afrâsiâh, but is taken prisoner and killed, on the command of the Sâh. His wife, who is pregnant, is saved by Pirân from the hands of the murderers. On condition of announcing at once the delivery of Feringis to the king, Pirân is granted permission to keep her in his house. The shade of the murdered Siâvaksh once comes to him in a dream, and tells him that an avenger has been born, and Pirân actually finds in the room of Feringis a newborn boy, whom he names Kaikhosrav. Afrâsiâh no longer insisted upon the killing of the boy, but he ordered Pirân *to surrender the child with a nurse to the herders, who were to raise him in ignorance of his origin.* But his royal descent is promptly revealed in his courage and his demeanor; and as Pirân takes the boy back into his home, Afrâsiâh becomes distrustful, and orders the boy to be led before him. Instructed by Pirân, Kaikhosvrav plays the fool,[39] and reassured as to his harmlessness, the Sâh dismisses him to his mother, Feringis. Finally, Kaikhosvrav is crowned as king by his grandfather, Kaikâus. After prolonged, complicated, and tedious combats, Afrâsiâh is at last taken prisoner, with divine assistance. Kaikhosvrav strikes his head off, and also causes Garsivaz to be decapitated.

A certain resemblance, although more remote, to the preceding saga, is presented by the Iranese myth of Feridun, as told by Firdusi in his "Persian Hero-Myths" (translated by Schack).

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[39] On the basis of this *motive of simulated dementia* and certain other corresponding features Jiriczek ("Hamlet in Iran," in the *Zeitschrift des Vereins für Volkskunde,* Vol. X, 1900, p. 353) has represented the *Hamlet Saga* as a variation of the Iranese myth of Kaikhosrav. This idea was followed up by H. Lessmann ("Die Kyrossage in Europa"), who shows that the Hamlet saga strikingly agrees in certain items, for example, in the simulated folly, with the sagas of Brutus and of Tell. (Compare also the protestations of Moses.) In another connection, the deeper roots of these relations have been more extensively discussed, especially with reference to the Tell saga. (See: Das Inzest-Motiv in Dichtung und Sage, Chapter VIII.) For the present attention is merely directed to the story of David, as it is told in the books of Samuel. Here again, the royal scion, David, is made a shepherd, who gradually rises in the social scale up to the royal throne. He likewise is given the king's (Saul's) daughter in marriage, and the king seeks his life, but David is always saved by miraculous means from the greatest perils. He also evades persecution by simulating dementia and playing the fool. The relationship between the Hamlet saga and the David saga has already been pointed out by Jiriczek and Lessmann. The biblical character of this entire mythical cycle is also emphasized by Jiriczek, who finds in the tale of Siavaksh's death certain features from the Passion of the Savior.

Zohâk,[40] *the king of Iran, once sees in a dream three men of royal tribe.* Two of them are bent with age, but between them is a *younger man* who holds a club, with a bull's head, in his right hand; this man steps up to him, and *fells him with his club to the ground.* The dream interpreters declared to the king that the young hero who will dethrone him is Feridun, a scion of the tribe of Dschemschid. Zohâk at once sets out to look for the tracks of his dreaded enemy. Feridun is the son of Abtin, a grandson of Dschemschid. His father hides from the pursuit of the tyrant, but he is seized and killed. Feridun himself, a boy of tender age, *is saved by his mother Firânek, who escapes with him and entrusts him to the care of the guardian of a distant forest. Here he is suckled by the cow Purmâje.* For three years he remains in this place, but then his mother no longer believes him safe, and she carries him to a hermit on the mountain Alburs. Soon afterwards Zohâk comes to the forest, and kills the guardian as well as the cow.

When Feridun was sixteen years old, he came down from Mount Alburs, learned of his origin through his mother, and swore to avenge the death of his father and of his nurse. On the expedition against Zohâk he is accompanied by his two older brothers, Purmâje and Kayânuseh. He orders a club to be forged for his use, and ornaments it with the bull's head, in memory of his foster mother the cow. With this club he smites Zohâk, as foretold by the dream.

(*To be continued*)

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[40] The name Zohâk is a mutilation of the original Zend expression Ashi-dahaka [Azis-dahaka], meaning pernicious serpent. See "The Myth of Feridun in India and Iran," by Dr. R. Roth, in the *Zeitschrift der Deutschen Morgenländischen Gesellschaft,* II, p. 216. To the *Iranese Firidum* corresponds the *Hindoo Trita,* whose Avestian double is Thraetavna. The last named form is the most predominantly authenticated; from it was formed, by transition of the aspirated sounds, first Phreduna, then Frêdûn or Afrêdun; Feridun is a more recent corruption. Compare F. Spiegel's "Eranische Altertumskunde," I, p. 537 et seq.

Periscope

Review of Neurology and Psychiatry

(Vol. X, No. 1)

1. Familial von Recklinghausen's Disease. J. D. Rolleston and N. S. Maenaughtan.
2. Mongols. Bertram C. A. Leeper.

1. *Familial von Recklinghausen's Disease.*—The first patient seen was a girl aged 13. She had punctiform pigment spots, *café-au-lait* patches, and blue spots over the neck, trunk, arms and thighs. A sister, aged 5, had *café-au-lait* patches. Both had a general yellowish tinge of skin. The father, aged 47, a printer, had a yellowish groundwork of pigmentation on the abdomen and inner side of the thighs, with pigmented spots and *café-au-lait* patches in those regions and over the anterior axillary folds. Microscopical examination of one of the father's tumors and of one of the elder girl's blue spots showed the presence of fibrous tissue but no nerve fibers. Two other children showed a yellowish skin and one, a boy of ten, after diphtheria presented a few pigment patches. The paternal grandfather, aged 72, had numerous small nævi on the trunk, but no molluscum, punctiform spots, or *café-au-lait* patches. The paternal grandmother, aged 73, had some nævi on the trunk, and a large area of pigmentation in the lumbo-sacral region. Both showed a slight yellowish tinge of the skin.

A plexiform fibroma was removed from the upper lip of the eldest child and was found to be attached by a pedicle to the right infra-orbital nerve.

The father and the eldest child had frequent " bilious attacks." After an acute infection, the manifestations of the disease were more marked. In the father, after pneumonia, the molluscous tumors became more numerous. In the children, after diphtheria, the blue spots in the elder girl, and the pigment patches in the younger children increased in number and size. There was no evidence of tuberculosis in any case. There were no physical nor mental signs of disturbance of the glands of internal secretion. In reference to gastric disturbance, it is of interest to note that in one of von Recklinghausen's own cases, miliary fibromata were found post mortem in the wall of the stomach and duodenum. Also, that familial vomiting in this disease has been recorded by others.

2. *Mongols.*—The author's article is based on 176 cases at Earlswood Asylum. Of these, 133 were males. Heredity played a strong role in causation. Hereditary factors often intermingled. Among them are mentioned: diseases of the nervous system, alcoholism, tuberculosis, syphilis, consanguinity, and age of parents. Among extrinsic causes, mental and physical conditions affecting the mother's health are the most important. During birth, the factor of abnormal labor, as a cause of mongolism at least, has been exaggerated. The same may be said of

primogeniture. Etiological factors after birth, such as trauma, toxicity, convulsions and epilepsy, and malnutrition, play a negligible role.

The principal physical characteristics of the mongol relate to the brachycephalic skull, the palpebral fissures, and the tongue. There appears to be an under development of the nose and superior maxilla, the inferior maxilla protruding laterally and the face having a pinched appearance. The ears are small and crumpled. The tongue is large and fissured. The papillæ are enlarged. Tongue sucking is universal. The nose is short and flat; the palate narrow and high; the skin coarse, dry and often withered looking. The hands are like those of the cretin; thumbs and little fingers short; abdomen large and humid; genitalia poorly developed; circulation is poor. Heart lesions are common. Respiratory diseases are very common. Tuberculosis is a frequent cause of death. Eye defects are common. Among those mentioned are squint, nystagmus, ectropion, and a definite form of cataract which the author has especially studied.

Mentally, mongols are as a rule quiet, good tempered, and easily amused. They often look intelligent and bright, are full of curiosity, and seem to take in everything around them. A baby mongol is full of grimaces. He is unable to sit up or walk at the usual age and is late in dentition and talking.

Pathologically, nothing of any special note was found in 50 autopsies, except a tendency to congenital malformations of all kinds (especially the heart), and a similarity to the cadaver of the premature child.

Anatomically, a noticeable feature is the premature closure of the bones at the base of the skull, due to imperfect development. The pons, medulla and cerebellum are relatively very small. The cerebral vessels are thin. The cerebrum is smaller than that of most imbeciles, and there is a marked lack of convolutions. The gray matter is scanty. Tubercular deposits are often found at the base. The membranes are many times adherent to the vertex and the pia cloudy at the circle of Willis.

(Vol. X, No. 2)

1. The Therapeutic Action of Psycho-Analysis. ERNEST JONES.
2. Disseminated Sclerosis: Record of Case With Long Periods of Remission. A. NINIAN BRUCE and W. F. BUIST.

1. *Therapeutic Action of Psycho-Analysis.*—The main thesis of this paper, as stated by the author, is as follows: Psycho-Analysis effects its cures by making the patient aware of the unconscious complexes that lie at the basis of his symptoms, thus enabling the pathogenic agents to become assimilated in consciousness. It achieves this by discovering and surmounting the internal resistances that are the cause of the repression, and which constitute the obstruction preventing the patient from becoming aware of and assimilating the pathogenic mental processes. As, further, it does not confine itself to the unconscious complexes immediately connected with the symptoms, but deals equally with the whole of the repressed material in the patient's mind, its action extends beyond the field of purely medical indications and gives the patient an inner control and self-insight that is not only the best guarantee against any tendency there may be to relapse into a neurotic state, but also the soundest basis for the guidance of his life in the future.

2. *Disseminated Sclerosis.*—The interest in this case consists chiefly

in the great length of time covered by periods of remission early in the course of the disease. The patient was a man, aged 41, single, who had always lived a healthy life in the country in the south of Scotland, as a young man, and later served in the army. His first "attack" (at 23) followed prolonged exposure to cold and wet; "the symptoms were well marked and passed. off quickly." He was free from symptoms for a period of seven years, during which he had undergone all the hardships of forced marches, etc., of the Boer War. At the end of this time, he had a second attack, not very severe, which appears to have followed exposure at mid-day to the South African sun. He recovered from this quickly, and his next attack did not date till six years later, during which time he had again served in the army, and had become one of the best and steadiest shots in the regiment. This attack was more severe than either of the two previous, but he still made a good though partial recovery, and was able to return to work again. The length of the periods of remission now diminished, as his next attack occurred three years later, and his recovery was again only partial, although he was able to return to work. The symptoms and course of such a case might strongly suggest a diagnosis of hysteria.

C. E. Atwood (New York).

Monatsschrift für Psychiatrie und Neurologie

(Vol. 31, No. 4. April, 1912)

1. Trauma and Tumor of the Ponto-Cerebellar Angle. W. Weygandt.
2. The Localization of Visual Pictures in Normal and Abnormal Persons. L. Maritn.
3. Findings in the Brain in Korsakoff's Psychosis. W. Volbrath.
4. The Grouping of Speech Associations. Pfersdorff.
5. The Question of the Sensibility Paths in the Human Spinal Cord. H. Fabritius.

1. *Trauma and Tumor.*—The article is, in a way, a sort of sermon on medico-legal testimony. A man sustained a slight injury to the head which did not incapacitate him at the time but a few months later symptoms of cerebellar tumor developed. It was known that auditory disturbance and signs of optic neuritis had been present months before the injury. A physician made an unqualified statement that the tumor was the result of the accident and on this basis the patient stubbornly refused operation and entered suit for damages. He died, however, a year after the accident. The tumor was found in the right cerebello-pontine angle. Its lethal effect had been purely mechanical, for the growth itself was a benign one—fibroma of dura. The case would have been easily operable. It obviously had no bearing on the injury. The author's reflection is that it would have been a much better professional attitude and, as was shown, of much more benefit to the patient, to have lost sight of the possible large award of damages and to have counseled operation.

2. *Visual Pictures.*—The author's method of studying the visualization of unseen objects is described in detail. The influence of light and darkness, size of room, closed or open eyes, etc., was investigated. Most of the article is taken up with a comparison of the author's technique, which she calls the M-projection method, with Liepmann's method of pressure on the eyeballs. Some interesting conclusions are arrived at regarding the

spontaneous hallucinations in delirium tremens. The animals seen are always in motion, because the eyes are constantly moving and this has been shown to have the effect of causing the imagined object to move. Animals are seen because it is more natural that animals should be running about than furniture. Large animals are seen in reduced size because the patient unconsciously adjusts these to conform with the interior of his room. The anxious affect brings up animals which have terrorized during health. The M-projection method has its principal value in the fact that, unlike Liepmann's and other methods, it may be used in health and thus the mechanism of the hallucinations be studied in the patient who has recovered from a real delirium.

3. *Korsakoff's Psychosis.*—The case was a typical one of Korsakoff's psychosis in a man of unusual mental attainments but alcoholic habits. In practically all parts of the brain was found the "chronic cell-alteration" of Nissl. The process was not uniform but of rather "patchy" distribution. The fibrils were also affected in irregular areas, but it was striking that not only was there no conformity between the changes in the Nissl granules and those in the fibrils but in fact it was the reverse. In the gyrus rectus there was very slight chromatolysis but very severe change in the fibril network. In the paracentral lobule where all processes were most marked there was moderate neuroglia increase, but this was nowhere marked and spider-cells were rare. The myelin-sheath picture showed a universal rarification of the fibers in the tangential and supra-radial layers. This was more prominent in the central regions than in frontal or occipital. The pia was normal.

4 and 5. Continued articles, to be reviewed at their conclusion.

(Vol. 31, No. 5. May, 1912)

1. Experimental Studies Regarding the Effect of Cerebral Hemorrhages, Cerebral Emboli, Epileptic Attacks and Cerebral Concussion upon the Circulation in the Brain. H. BERGER.
2. The Histopathology of Cysticercus of the Brain. K. KRAUSE.
3. The Question of the Sensibility Paths in the Human Spinal Cord. H. FABRITIUS.
4. The Grouping of Speech Associations. PFERSDORFF.

1. *Effect of Cerebral Hemorrhages, etc.*—The experiments were made upon dogs and a number of blood-pressure curves taken from the brain and from the general circulation accompany the test. The chief fact established is that the conception that a reflex anemia of the brain is responsible for the sudden loss of consciousness in hemorrhage, emboli, etc., is erroneous. As a matter of fact there is usually a dilatation of the cerebral vessels.

2 and 3. Continued articles, to be reviewed at their conclusion.

4. *Speech Associations.*—Thirteen case records are given with liberal samples of the characteristic production of each. They are then divided into three main groups with some subgroups. Group *A*, I, showed a disorder of speech-production which was obviously a part of the psychomotor excitement. The majority of the content was coherent. There were sudden variations in tone—loud shouting followed by whispering. In *A*, II, there was periodic motor excitement consisting of athetoid finger-movements, etc., accompanied by disordered production. In this group there was absolute incoherence, agrammatism, neologisms. The voice was

monotonous. Group *A*, III, showed no psycho-motor excitement but marked productivity occurring periodically. Group *B* produced short sentences, usually without sense although with correct syntax. The characteristic feature of this group, though, was the accent or tone of voice. Like Group *A*, I, there were sudden variations from loud cries to whispering, but there was the difference that these cases showed no psycho-motor excitement. Besides the quick changes there were strange intonations, affectation and often mimicry. In Group *C* the disorder was not entirely verbal as in the other groups, but the associations were in obvious relation to the meaning of the words used. Flight of ideas was prominent. Several types of association in this flight are differentiated. In conclusion, the theories of speech associations by other authors are summarized. No very important deductions are made.

(Vol. 31, No. 6. June, 1912)

1. The Various Systems of Nerve Fibers in the Corpus Callosum in Man. G. Mingazzini.
2. The Histopathology of Cysticercus of the Brain. K. Krause.
3. The Question of the Sensibility Paths in the Human Spinal Cord. H. Fabritius.

1. *Corpus Callosum.*—The embryological studies of the author have shown that there are three different sets of fibers in the corpus callosum according to the period of their myelinization. The laminæ superficiales (dorsal and ventral) are the first to receive their sheaths, next the laminæ profundæ (dorsal and ventral) and last, the lamina media. It is probable that these sets of fibers possess different origins and courses and convey different impulses. By his findings the author believes the degenerations found in the corpus callosum in alcoholics by Marchiafava and Bignami can be explained. The degeneration occurs in the middle layer, or the one which is the last to receive its myelin. Where more than the middle layer is involved the next to go is the deep layer, which in turn is the next youngest in point of myelinization.

2. *Cysticercus.*—Two cases are reported. One a man of 24 years with epileptic attacks and a progressive mental deterioration fairly typical of that accompanying epilepsy. The duration was 15 years. The second case was in a woman of 56. She was demented and occasionally excited, there were a number of neurological signs including a partial hemiparesis, optic atrophy and paresthesias. She lived four years after entrance to the hospital. In both cases numerous cysticerci were found in the brain, both in meninges and within the brain-substance. The microscopical findings are given in great detail. Besides the local change from the presence of the organism itself there were prominent diffuse changes in the cortex which were possibly of toxic origin from the retained and possibly decomposing cysticerci. The exclusion of other organic diseases, namely epilepsy in one and senile disorder in the other, as causes of this general process, is difficult.

3. *Spinal Cord.*—When we speak of conduction paths in the spinal cord we must distinguish two kinds—those which convey impulses in the normal state, and those which may be established after destruction of the normal paths. To the first applies the dictum of Brown-Séquard that all qualities of cutaneous sensation are carried in the contralateral ascending columns, touch and pressure sense in these and also in the dorsal column of the

same side, pain and temperature only in the opposite side. Immediately after the cutting off of one of these columns, touch and pressure senses on the opposite side are affected little or none, pain and temperature senses are lost, but after a while strong mechanical excitements as severe pressure or very high temperature begin to elicit a new quality of sensation which the author has described in previous articles and which coincides with Monakow's "diffuse cortical sensibility." It does not resemble the old painful sensation but is described as a disagreeable, tickling or creeping feeling. If both dorsal columns are interrupted there is, at first, complete anesthesia, but after a short time touch and pressure senses return and later, the peculiar sensation just described. The reëstablishment of new paths is doubtless accomplished in the gray matter. The author briefly states his opinion thus: The dorsal columns and their impressions have a, so to speak, more objective, the contralateral bundles a more subjective, vital importance for the individual.

J. W. MOORE (Central Islip).

Revue Neurologique

(August 15, 1912)

1. Remarks, Anatomical and Clinical, on the Operation of Franke for the Gastric Crises of Tabes and the Pains of Herpes Zoster. J. A. SICARD AND LEBLANC.
2. Researches on the Physico-Chemical Composition of the Normal Cerebrospinal Fluid. THABIUS AND BARBÉ.

1. *The Operation of Franke.*—The operation proposed by Franke for the relief of gastric crises consists of the bilateral avulsion of the fifth to the tenth intercostal nerves. Because the degree of damage cannot be controlled in the operation and also because the symptom usually returns the operation is regarded as dangerous and useless. The authors report two cases in which the operation was done for intolerable pain following an intercostal zoster. In one there was no relief; the other died.

2. *Physico-Chemical Composition of the Normal Cerebrospinal Fluid.*—An analysis of fifteen specimens. The density varied from 1.010 to 1.0025. The total solids at 110° C. varied from 10 to 15 gm. per liter; ash 7 gm. to 8.9 gm. per liter; chlorides 7 gm. per liter. The freezing point was —0.55° to —0.78°. The reaction was alkaline. All specimens contained albumin, urea and sugar. Ammonia was present to the extent of 0.422 gm. per liter. Phosphates were present in organic combination probably as glycerophosphate. Sulphates were not present. The spinal fluid closely resembles amniotic fluid in its composition.

(August 30, 1912)

1. Contribution to the Study of Aphasia in the Left-handed and of the Degeneration in the Corpus Callosum; Report of Case Followed by Autopsy. J. DEJERINE AND ANDRÉ-THOMAS.
2. Anatomic, Histologic and Chemical Research on the Thyroid Gland in Epilepsy. G. PARHON, C. DUMISTRESCO AND MLLE. E. NICOLAU.

1. *Aphasia in the Left-handed.*—The patient had two attacks of hemiplegia involving the left side. Following the second attack she showed

complete paralysis on the left side, left homonymous hemianopsia and some diminution of sensation on the left side. Speech was a little scanning and "telegraphic" (agrammatism); repetition of speech and understanding of speech were normal. Reading aloud was much impaired. Spontaneous writing and writing to dictation were very poor. Copying was perfect. The intelligence was normal. An examination, five years after the attack, showed some agrammatism and difficulty in writing spontaneously or to dictation; other aphasia tests were negative. Death occurred six years after the attack and an examination of the brain showed a very extensive cortical and subcortical lesion of the right hemisphere destroying the ascending frontal and parietal convolutions, practically all of the parietal and occipital lobes, the insula and the first temporal and the posterior part of the second and third temporal convolutions. According to the author the recovery from the aphasia is to be attributed to the fact that the patient, although left-handed, had been taught to write with the right hand. Had the patient been uneducated in the use of the right hand, the aphasia would have been total and permanent.

2. *The Thyroid Gland in Epilepsy.*—In epilepsy, the weight of the gland is usually below normal; histological changes are frequent but variable in type; and the iodin content is increased.

(Sept. 15, 1912)

1. Contribution to the Study of Cortical Motor Localisation. Histologic Lesions of the Ascending Frontal Convolution in a Case of Amyotrophic Lateral Sclerosis. A. SOUQUES AND A. BARBÉ.
2. The Physiologic Significance of the Cutaneous Reflexes of the Lower Limbs. W. VAN WOERKOM.

1. *Cortical Motor Localisation.*—In a case of labio-glossolaryngeal paralysis, autopsy showed degeneration in both pyramidal tracts and of the cells in the anterior horns of the spinal cord, of both pyramids in the medulla and the nuclei of the facial and hypoglossal nerves, and the posterior longitudinal bundle. The cells and fibers in the ascending frontal convolution were much altered but in the ascending parietal convolution there was no change in the cells and very slight fiber degeneration. The motor cortex seems to be entirely in front of the central convolution.

2. *The Physiologic Significance of the Cutaneous Reflexes.*—The phenomena of Babinski is a vestige or revival of a lost function. When man changed from an arboreal to a terrestrial primate, the foot underwent an appropriate change. The function of the adductor hallucis being not needed, it was replaced by the long extensor hallucis and, therefore, the purely spinal reflex from irritation of the sole is extension.

(September 30, 1912)

1. Examination of the Nervous System in a Case of Friedreich's Disease, Atrophy of the Medulla, of the Lemniscus and of the Superior Cerebellar Peduncle. ANDRÉ-THOMAS AND A. DURUPT.
2. The Reflexes of the Tendo-Achilles and of the Tensor Fascia Lata in Radicular Sciatica and in Truncal Sciatica. BONOLA.

1. *The Nervous System in Friedreich's Disease.*—The patient, about twenty years old at the time of his death, had suffered from Friedreich's

disease for many years. The histological examination of the spinal cord showed degeneration of the posterior columns, the crossed pyramidal tracts, the direct cerebellar and Gowers' tracts and of the direct pyramidal tract down to the dorsal region. The medulla was smaller than normal, due chiefly to the degeneration in the nuclei of the columns of Goll and of Burdach and of the internal arcuate fibers. The nucleus of Monakow, the direct cerebellar tracts, the tract of Gowers', the descending root of the trigeminus and the solitary fasiculus were also degenerated. In the pons the degeneration was most marked in the median lemniscus and the lateral lemniscus, the trapezoid body, the superior olive, and the fibers forming the arms of the posterior corpora quadrigemina. In the cerebellum the cells of Purkinje, the white matter and the median nuclei were normal but the nucleus dentatus and the superior cerebellar peduncles were much degenerated. The degeneration of the median lemniscus could be traced through the cerebral peduncles and up to the thalamus.

2. *The Tendo-Achillis Reflex.*—When the symptoms are due to an inflammation of the roots of the sacral plexus, the condition is spoken of as radicular sciatica; when it affects the branches of the plexus, as a truncal sciatica. Four cases of radicular sciatica are reported in all of which the Achilles reflex and the reflex of the tensor fascia lata were equally affected. The author concludes that in patients affected with sciatica and disturbance of the reflexes, the abolition or diminution of both these reflexes may be interpreted as a sign of radiculitis; but when the diminution or loss of the Achilles reflex exists with conservation of the reflex of the tensor of the fascia lata, the sciatica is due to an affection of the trunk of the nerve.

(October 15, 1912)

1. Two Cases of Syphilitic Hemiplegia Complicated by Amblyopia Due to Lesion of the Optic Nerves—One in a Child, and the Other in an Adult. Noïca and Dimelescu.
2. Associated Movements with Athetosis. A. de Castro.
3. Dementia Præcox or Schizophrenia According to the Conception of Bleuler. Trénel.

1. *Syphilitic Hemiplegia and Amblyopia.*—The chief symptoms in the adult were: severe headache, sharp pains in the extremities and a slowly developing hemiplegia. The blindness came on gradually and was practically total. The Wassermann reaction was present in the blood. The pupils were dilated and did not react to light or in accommodation and there was a double optic neuritis. Treatment consisted of four intravenous injections of .25 gm. of salvarsan; four injections of gray oil, each .07 gm.; and 40 gm. of potassium iodid by mouth. At the end of about six weeks he was able to read fine print and the pupils would react to light. The optic neuritis was improved. The second case was in an infant twenty months old. At the age of nine months the child began having epileptic attacks and became blind. The cerebrospinal fluid contained an excess of lymphocytes. Mercurial inunctions stopped the attacks but the paralysis and blindness were not improved. In the first case the lesion was probably at the base; in the second, more likely in the cortex.

2. *Associated Movements and Athetosis.*—In cases of congenital athetosis the phenomena of associated movement is very pronounced.

3. *Bleuler's Conception of Dementia Præcox or Schizophrenia.*—An

abstract of Bleuler's article on dementia præcox published in Aschaffenburg's "Handbuch der Psychiatrie." By this term is designated a group of psychoses which progress sometimes chronically, sometimes acutely and sometimes with stages of arrest or improvement but never a return to normal. They are characterized by a specific alteration of thought, of sentiment and of relation with the external world. Bleuler includes a number of syndromes under the name schizophrenia but admits four general groups: paranoid, catatonic, hebephrenic and simple schizophrenia.

(October 30, 1912)

1. The Phenomena of the Fingers. A. Gordon.
2. Synchronous Adduction of the Arm Involved in an Organic Hemiplegia. W. Sterling.
3. Mechanism of the Phenomena of Retraction of the Lower Limb Caused by Plantar Flexion of the Toes. Ozorio and Esposel.
4. Reflexes in the Fetus. K. Krabbe.

1. *Finger Phenomena.*—Described by the author in the *Journal of the American Medical Association* in November, 1911. The wrist of the subject is grasped by the operator in such a way that the operator's fingers encircle the dorsal surface of the wrist. The operator's thumb presses firmly on the pisiform bone, or a little to the radial side. In normal individuals or in hysterical hemiplegia, there is no movement of the fingers but in cases of organic hemiplegia some or all of the fingers extend.

2. *Adduction of the Arm in Hemiplegia.*—The subject lies on his back with both arms fully abducted. If he adducts the arm on the sound side there will be noticed a feeble contraction of the opposite pectoral muscle but no movement. If the adduction of the normal arm is opposed, then the paralyzed arm will be passively adducted; sometimes rapidly, sometimes slowly, and sometimes by a series of jerks. No movement will occur if the arm is completely paralyzed. The phenomenon is analogous to that described by Raimiste in the lower extremities.

3. *The Mechanism of Retraction of the Leg.*—The movement is provoked by a forcible flexion of the toes and transverse pressure on the foot. It consists of a flexion of the thigh on the pelvis, the leg on the thigh, the flexion of the foot on the leg with adduction and internal rotation of the foot by the contraction of the anterior tibial muscle. The author finds that an ischemia produced by an Esmarch bandage above the knee stops the phenomenon and concludes that only the first movement, the flexion of the foot on the leg, can be considered as a reflex; the other movements are associated.

4. *Reflexes in the Fetus.*—The author had an opportunity to examine a fetus born at the fourth month, that lived one half hour after birth. The biceps jerks were absent but direct percussion on the muscles produced an active contraction. The abdominal reflexes were active. The knee and Achilles reflexes could not be obtained and percussion on the muscles of the lower extremities caused no contraction. Plantar irritation caused flexion of the toes. Oppenheim's reflex was not obtained. A post-mortem examination of the brain of the fetus showed no gross lesion.

(November 15, 1912)

1. The Culture of the Spinal Ganglia of Mammals in Vitro, Contribution to the Study of Neurogenesis. G. Marinesco and J. Minea.
2. Some Mental Syndromes Due to Cerebral Syphilis. Arsimoles and Halberstadt.

1. *Culture of Spinal Ganglia in Vitro.*—As suggested by Harrison, perfected by his pupil, Burrows, and applied by Carrel, the cultivation of tissue in vitro has been one of the great conquests of contemporary biology. The authors used the method of Carrel. The spinal ganglia of rabbits and kittens were excised, washed in warm, sterile Ringer-Carrel solution, cut in small pieces and placed in autogenous or heterogenous plasma. Fine filaments were observed growing from the cells in 24 hours. Only the cells at the periphery survive and show new formations; those in the center die and undergo chromatolytic change. These researches prove that the nerve cell, by its own energy, gives rise to the growth of new nerve fibers, which can occur without the influence of any other factor than the cell of Origen but the direction and general conduct of the growth is under the influence of diverse tropisms exerted by other elements.

2. *Mental Syndromes in Cerebral Syphilis.*—The syndromes chiefly considered are the confusional, periodic and paranoid. A mental condition closely resembling Korsakoff's syndrome may develop in tertiary syphilis—disorientation, amnesia and fabulation accompanied by periodic somnolence. Whether this condition is due to a syphilitic intoxication, increase of intracranial pressure or organic brain lesion is undecided. Maniac depressive insanity may simply co-exist with syphilis of the brain but a similar syndrome of periodic attacks of hypomania may be a symptom of cerebral syphilis. The clinical picture may be the same as in the true circular insanity but the history of infection, the onset of the attacks suddenly, the Wassermann reaction, etc., aid in the diagnosis. Raymond and Janet have published a case of excitement and depression in an hereditary syphilitic which was improved by specific treatment. The correct diagnosis is very important from the viewpoint of prognosis and treatment. Cerebral syphilis may cause a mental syndrome closely resembling dementia præcox paranoides, beginning with systematized delusions, stereotypy, negativism, etc., and ending in dementia and death. This syndrome may exist with a tabes.

(November 30, 1912)

1. Physico-Chemical Study of the Cerebrospinal Fluid in General Paralysis. Thabius and A. Barbé.
2. Alterations in the Gasserian Ganglion in a Case of Chronic Neuralgia (An Anatomic-Pathological Study of the Tissue One Half Hour After a Gasserectomy, by Means of Frozen Sections.). René Horand.
3. The Finger Phenomenon. A. Souques.

1. *The Cerebrospinal Fluid in General Paralysis.*—The methods of procedure and a detailed analysis of the cerebrospinal fluid of eleven cases of paresis is given. There is practically no variation in the fluids of the same subject examined at different times. It varies from normal cerebrospinal fluid very little in density but, in general, the density is a little higher in general paralysis. In general paralysis the freezing point is

—0°.65, in the normal —0°.56. The fluid in general paralysis contains less extractive than the normal fluid, but more ash and a little more sodium chloride. Sulphates are not present in either case but phosphates, absent in normal fluid, are constantly present in general paralysis. Traces of urea are present in both cases. In general paralysis the amount of albumin is increased to about one gram per liter.

2. *The Gasserian Ganglion and Neuralgia.*—Macroscopically the gland appeared firm and somewhat larger than normal. Microscopically there was seen an hypertrophy of the interstitial tissue and degeneration of the nerve cells. The capsules of the nerve cells participated in the inflammation and there was a marked pericellular infiltration. There was also an endarteritis obliterans.

3. *The Finger Phenomenon.*—The author calls attention to the fact that the phenomenon, described by Alfred Gordon in the *Journal of the American Medical Association,* in November, 1911, was described by him in 1907.

C. D. Camp (Ann Arbor).

Deutsche Zeitschrift für Nervenheilkunde

(Band 44, Heft 3)

1. A Peculiar New Disease. Fleischer.
2. Upper Abdominal Symptom Complex in a Case of Tumor of the Spinal Cord. Söderbergh.
3. Further Studies in Bornasche's Disease. Joest.
4. Cerebral Aneurysm. Wicheru.
5. Bilateral Paralysis of the Brachial Plexus. Bragman.

1. *A Peculiar New Disease.*—Report of cases similar to multiple sclerosis or pseudosclerosis, which were characterized by pigmentation of the cornea and skin, tremor, psychic disturbances and in two cases with diabetes. Pathological findings failed to show any sclerosis of the nervous system, while the liver showed sclerosis and the spleen was enlarged.

2. *Abdominal Symptom Complex.*—The diagnosis of psammoma at the level of the 7th thoracic was not difficult in this case. It was confirmed by operation. The abdominal muscles were spastic, no reflexes were present on coughing, palpation showed a paresis of the upper part of the left rectus abdominus. Electrical excitability was reduced in the upper left abdominal oblique. The epigastric median line was deflected slightly towards the right side.

3. *Bornasche's Disease.*—Since the pathway of infection seemed to be through the nasal chambers, the writer studied the pathological changes in the olfactory bulbs. He found inclusion bodies in the ganglion cells, and considered them as reaction products of some toxic agent.

4. *Cerebral Aneurysm.*—The writer reported 2 cases of cerebral aneurysm with necropsy.

From a clinical analysis of some 22 cases coming to necropsy, he found the following symptoms frequent enough to warrant a diagnosis in hitherto unrecognized cases. They were, the sudden onset of severe cerebral symptoms, with persistent headache and rigidity of the neck, recurring over varying periods of time, and finally the presence of altered red blood cells, xanthochromia and secondary lymphocytosis in the cerebro-spinal fluid.

5. *Brachial Plexus Palsy.*—The author reported two cases of double plexus palsy of the Duchenne Erb type, one due to fracture dislocation of the 4th cervical vertebra, the other of toxic origin.

(Band 44. Heft 4)

1. Von Dungarn's Modification of the Wassermann Reaction. KÖRTKE.
2. Scleroderma. DONATH.
3. Muscular Headaches. MÜLLER.

1. *Von Dungarn's Modification.*—Despite the simplicity of this method, which would permit the average physician who was not in touch with a serological laboratory to verify the clinical symptoms of syphilis, Körtke found that the method could not replace the Wassermann reaction. Further investigation he thought might however improve its worth. Both Wassermann and Plaut found it unsatisfactory.

The technique consisted in placing 2 c.c. of normal salt solution in 2 test tubes. To one of these is added .05 c.c. of an alcoholic extract of guinea pig's heart. In each test tube was added 2 portions of filter paper containing guinea pig serum.

To each tube was added .1 c.c. of the defibrinated blood of the patient.

This was shaken several times during one hour. Then the amboceptor, according to the method of Noguchi, was added. The reaction followed shortly after the tubes were shaken.

Scleroderma.—This disease has been most frequently associated with Basedow's and Raynaud's disease. The author gave the clinical report of his cases. Thyroid extract produced some improvement in the first case and marked improvement in the second.

S. LEOPOLD (Philadelphia).

Journal of Mental Science

(Vol. 54, No. 227. October)

1. The Physical Basis of Mind. CHARLES MERCIER.
2. Some Further Observations Bearing on the Supposed Thrombotic Origin of Epileptic Fits. JOHN TURNER.
3. The Question of Dementia Præcox. ROBERT JONES.
4. Dementia Præcox. A. R. URQUHART.
5. Leucocytosis: Its Relation to, and Significance in, Acute Mental Disorders. COLIN F. F. MCDOWELL.
6. Asylum Officials; Is it necessary or advisable for so many to live on the premises? FRANK ASHBY ELKINS.
7. Some Aspects of Inebriety. LADY HENRY SOMERSET.
8. On the Principles of the Treatment of Epilepsy. ALAN MCDOUGALL.
9. Atropine Treatment of Morphinomania and Inebriety. MARY S. P. STRANGMAN.

1. *Physical Basis of Mind.*—The Presidential Address delivered at the 67th Annual Meeting of the Medico-Psychological Association, held in London July 23 and 24, 1908; by Charles Mercier. Starting with the fundamental modes of consciousness as pleasure and pain, desire and aversion, will, sensation, thought and memory, the writer discusses each one in respect to a physical basis. Memory is the recurrence in the brain of a process that has occurred before in the same part of the brain. Structural memory is an affair of nerve paths. Conscious memory the accompaniment of the passage of motion through these nerve paths.

Sensations, thoughts and volition can be reproduced in memory, but not desires, aversions, pleasures or pains. In appreciating the different sensations it seems less conceivable that there is a special area for each variation and kind of sensation than that there is a difference in the quality of the current passing through the same system of nerves. The physical basis of sensation is the reception of ingoing currents at the highest level at which currents remain afferent. The process of thought is the establishment of relation between mental states. As the existence in the mind of any mental state is conditioned by the activity of an area of grey matter, so the bringing into relationship of two or more mental states makes it necessary to have successive activity in these various areas of grey matter or a speed of motion from one area to another. As sensation is the reception of motion and has therefore a physical basis, it must follow that the emission of motion to the musculature involves a mental factor; volition, desire, illustrated by the sexual desire, has a physical basis in the subtle changes exerted on nerve tissues by the chemical products of the sexual glands. Pain is explained on the hypothesis of the delivery into the convolution of currents from tissues in which katabolism preponderates over anabolism. Pleasure, in which strong vigorous currents are passing in, indicating a preponderance of anabolism over katabolism.

2. *Supposed Thrombotic Origin of Epileptic Fits.*—That epilepsy is associated with structural defect of the nervous system, is proven by autopsies even on patients above the average intelligence of their class. The exciting cause of the fits, in the writer's opinion, is the sudden stasis of the blood stream in the cortex due to thrombosis in the smaller vessels. The author's investigations prove that the blood of epileptics shows a temporarily quickened coagubility before and during fits. This quickening of coagulation may be due to certain toxins which may tend to produce thrombosis, in turn fits. Slowness of coagulability is associated with high blood pressure, a possible indication for a line of treatment.

3-4. *Dementia Præcox.*—Jones and Urquhart reach practically the same conclusions, *i. e.,* that there is no "dementia præcox." They take up term by term, symptom by symptom, and critically dissect them. Their conclusions would not receive much sympathy from students of psychiatry in this country at the present time, and their papers show a fundamental lack of appreciation of the significance of the use of symbols for disease processes in general.

5. *Leucocytosis in Acute Mental Disorders.*—Brief accounts of eighteen cases are given, six being classed as excitement with confusion, acute mania, six as depression without excitement, and six as depression with excitement. The author reaches some definite conclusions. In every recent primary case of acute mania and also of depression with excitement a leucocytosis more or less marked is present. It may be that there is as a common cause for both classes a single toxin (therefore why not call these cases manic depressive psychosis?—Reviewer). Only an occasional leucocytosis is found in depression without excitement, perhaps due to the fact that they reach the hospital later in the disease. In cases that do well, the leucocytosis gradually falls. Prognosis is also good if the polymorphonuclear percentage keeps up. There is also an eosinophilia early in the disease in those cases of acute mania which recover.

6. *Asylum Officials.*—The writer concludes that it is desirable to have as many as possible of the employees live outside, both because the insti-

tution's expenses are reduced, and because it is better for their health and efficiency.

7. *Some Aspects of Inebriety.* The address gives some of the results of the thirteen years' experience at the Colony for Inebriate Women at Dixhurst. To get the best results from such an institution care must be taken to weed out the imbecile and psychotic and to separate those from the same locality. To accomplish much, the individuals must be under care for at least one year. Attention is called to the prevalence of drug takers, even habitues of veronal being quite common. The monotony of life in the poorer classes and the stress of daily engagements among the affluent cause excessive use of stimulants, on the one hand as a recreation and diversion, on the other, to produce a sham vitality. The plan at the Colony is to treat the inmates medically, then "to try to build up the ideal of home," giving them also occupations which are different from what they are accustomed to, and arousing their interest and self-respect. A present-day difficulty to be overcome is the popular idea of "hereditary predisposition to drunkenness," which makes some cases take a fatalistic attitude. Many of the most efficient and sympathetic workers at the Colony are former inmates.

8. *Epilepsy.*—In a recent case of epilepsy where the fits have been few, it is justifiable to make a vigorous attempt to cure the disease, and subject the patient to restrictions. When the condition has become chronic and there is little hope that the fits will cease to occur, something more must be done. It is rarely practicable for an epileptic to be useful in a non-epileptic community. Except in the mildest cases therefore, he should live in a community of epileptics, where he is a normal citizen and must do his share of work.

9. *Atropine Treatment of Morphinomania and Inebriety.*—The writer reports two cases of morphinism, one successfully, and the other unsuccessfully treated by McBride's method, which is the gradual withdrawal of morphine and the giving atropine sulphate combined with strychnine three times a day, increasing doses. In the first case, a man of 60, who had taken opium for thirty-two years, a usual daily allowance being four ounces of laudanum, a permanent cure is said to have been affected in fourteen days. At least he took no opium for over a year until his death. Several cases of alcoholism were also treated with success by this same method.

W. C. Sandy (King's Park, N. Y.)

Miscellany

The Symptomatology of Cerebellar Tumor in Children. Fiore, G. (Revista sperim. di freniatria, XXXVII, 1911, I, II, III.)

(The prize of the Galigo Foundation was awarded for this monograph by the Academy of Medicine of Florence, April 30, 1909.)

I. *The Meningeal Syndrome in the Last Stage of Cerebellar Tuberculosis*

The author reports and discusses seven typical cases and concludes from a critical analysis of the principal symptoms that one should exercise great caution in making a diagnosis of tuberculous encephalitis complicating tuberculous meningitis, and that it is well to bear in mind that the signs of endocranial tumor appear before the meningeal syndrome becomes manifest.

One should be even more guarded in diagnosing meningitis in a child in which tuberculous encephalitis is suspected. It is safer not to express any opinion until all signs have become manifest. There are two tests which ought never to be omitted: Examination of the fundus of the eye, as an endocranial tumor would be revealed by a lesion of the papilla, and lumbar puncture. Often the latter measure alone will prove the existence of a meningeal process.

II. *The Symptomatology of Cerebellar Tumor*

The author has classified these under three headings.

A. Constitutional Symptoms.—(1) Headache. This is a prodromal symptom and when occurring later in the disease is of comparatively little importance. It is more often frontal than occipital. The author mentions the differential characteristics of the headache in malaria, epilepsy and migraine. (2) Vomiting occurs in most cases, usually at the onset, but occasionally in the last stage, and is seldom very persistent. The mechanism of vomiting in cerebellar tumor is explained. (3) Stasis of the papilla is usually bilateral; when unilateral it is not necessarily the side on which the tumor is situated that is affected. (4) Vertigo is never well marked, and is not a constant sign in children, and is only present when walking or standing. (5) Psychical disturbances have been observed in 50 per cent. of Fiore's cases and always at an early stage. He attributes them directly to the cerebellar lesion and bases this opinion on the results of animal experiments, and on the study of his own cases and those reported in the literature. He points out that in tuberculous cases the effect of the toxins of the tubercle bacilli may cause mental disturbances. (6) Changes in the percussion notes of the cranium may be of great value in the diagnosis.

B. Cerebellar Symptoms.—After a brief, but thorough discussion of the physiology of the cerebellum he takes up from an experimental and clinical point of view all the neuro-muscular phenomena on which the clinical value of cerebellar ataxia is based. (1) Asthenia is a symptom of great importance in the diagnosis of cerebellar tumor. When affecting the muscles of only one side of the body it is usually on the same side as the tumor. It is however not always present, even when the ataxia is marked. It is only manifest in standing and walking, when it is apt to increase to complete disability. (2) Atony, hypertonus and tonic spasms. Many clinicians deny the possibility of these signs on disease of the cerebellum. Recent experimental studies have nevertheless demonstrated that excitation of the cerebellar motor centers gives rise to tonic contractions. As the tumor has an irritating as well as a destructive action it is illogical to expect a depressing effect only, and we may look for disturbances of the muscular tone, and it is more likely to cause hypertonia than hypotonia. Hypotonia when present affects chiefly the lower limbs, in walking and standing. It is not a lasting symptom; it appears in the middle stage of the disease and is replaced in the last stage by hypertonia. The author mentions three degrees of hypertonia: retraction of the head, opisthotonus, and extensor spasm before and after flexion of the limbs. These tonic spasms do not prevent voluntary movements and are the direct consequence of the cerebellar irritation, though not always corresponding to the side on which the tumor is located. (3) Astasia. Under this heading he discusses the instability of gait, scanning speech and incoördinate movements not due to paresis. The phenomena of astasia are generally only apparent in the standing posture and in walking, but the author has not infrequently observed them also in the sitting posture. They are most marked on the side on which the tumor is. (4) Ataxia. It is possible in cerebellar tumor to have marked ataxia coupled with slight asthenia and atonia. These patients cannot overcome in a normal manner the oscillations of the head and body at the shifting of the center of gravity and in order to maintain their equilibrium in walking they resort to a number of compensatory movements. The gait is the most characteristic feature of cerebellar ataxia and completes the clinical picture of signs produced by disturbance of the muscular tone, asthenia, astasia, incoördination, tremors and tendency to bend the body towards one side. It is not an early sign. From a study of the cases reported in the literature, as well as his own, he finds ataxia present in two-thirds of the cases in children.

The middle lobe of the cerebellum is the one most frequently affected.

It is of course possible to have cerebellar ataxia in other conditions, as, chronic internal hydrocephalus and extracerebellar, endocranial tumors. Fiore discusses the differential features of these possible combinations.

C. Symptoms Referable to Surrounding Structures

1. *Convulsions.*—Besides general and partial convulsions there may be unilateral tonic contractions, sometimes on the same side as the tumor, sometimes on the opposite side. These are due directly to the cerebellar lesion and are an important diagnostic sign.

2. Inferior paraplegia and paralysis of cranial nerves. The motor and sensory branches of the fifth nerve, and the hypoglossal nerve are rarely affected, but the facial nerve is frequently involved, usually on the same side as the tumor, but sometimes on the opposite side.

3. *Affections of the Ocular Muscles.*—There is nothing of especial interest here except convergent strabismus and nystagmus, the latter on the same side as the lesion.

4. *Sensory Disturbances.*—The muscular sense is preserved. The special senses are intact, except vision. Optic neuritis is common.

5. *Reflexes.*—The pateller reflex is usually unchanged, but may be absent, or increased, dependent upon the muscular tone. He discusses in detail the effect on the tendon reflexes of the systemic intoxication, especially in tuberculous cases, when there is a complicating lesion of the cortico-spinal inhibitory tract. In cerebellar tumor there is frequently antagonism between the superficial and deep reflexes.

6. Vasomotor disturbances are quite frequent.

7. Temperature, pulse and respiration.

One case of prolonged hypothermia has been noted.

The pulse and respiration do not manifest any changes until the end when the increased rate is due to bulbar compression by the rapidly growing tumor.

Recent experiments indicate that bulbar compression results in an apparent dissociation of the pulse rate and respiration rate owing to the increased excitability of the respiratory center.

JELLIFFE.

Book Reviews

A TEXT-BOOK OF NERVOUS DISEASES. By Aldren Turner and Grainger Stewart. P. Blakiston's Son & Co., Philadelphia, 1910, pp. 607. Price $6 net.

This work is a well-printed, well-illustrated work on diseases of the nervous system. From the bookmaker's standpoint everything favorable might be said of it, except the color of its binding, which is indescribable and can only be mentioned as striking terror to the soul of the artistically inclined, unless perhaps they belong to some of the newer schools, for example the post-futurists.

As for the contents of the book, they contain so far as the organic diseases of the nervous system are concerned everything that could be wished for. It is the same sort of material that the reviewer has been finding between the covers of the neurologies for years, a carefully elaborated index of nervous diseases described one after the other with formal regularity. When is a prophet going to arise in the neurological world who will inject the spark of a new life into this everlasting cataloguing of neurological material? The work, however, is well done, as are many other neurological works. For the most part it may be said to be well up to the date of its publication. The reviewer notices for example with a great deal of satisfaction a most excellent description of the uncinate fit.

As regards the discussion of the functional conditions, however, very little can be said in praise. The chapter on hysteria might as well have been written twenty years ago, although a footnote discloses the fact that the authors do know of Janet. The discussion of the disease, however, is a formal repetition in anatomical sequence of the different disturbances that may be found. The same thing may be said of the chapter on neurasthenia, while we find that epilepsy is still considered as a disease and epileptic *insanity* is one of its manifestations. Here we have of course the same old story, the following in the ruts from which a little broader philosophical insight should have delivered the authors.

ANLEITUNG BEIM STUDIUM DES BAUES DER NERVÖSEN ZENTRALORGANE IM GESUNDEN UND KRANKEN ZUSTANDE. Von Dr. Heinrich Obersteiner. Fünfte vermehrte u. umgearbeitete Auflage. F. Deuticke 22 Marks.

Obersteiner's introduction has been the standard work of practically all students of neurology. It now appears in its fifth edition. To find an anatomy, at once so complete and detailed, going into a fifth edition is almost sufficient evidence of its usefulness but Obersteiner's work has always been preëminent by reason of its exactness with detail combined with a grasp of the general situation lacking in many other works of related character.

There are nearly 300 illustrations which render the work of special advantage to the student who desires to teach himself. Many of them might be improved upon, however, in these days of photography.

One can hope for a continuance of the excellent reception which this book has always found.

MEDICAL MEN AND THE LAW. A Modern Treatise on the Legal Rights, Duties and Liabilities of Physicians and Surgeons. By Hugh Emmett Culbertson. Lea & Febiger, Philadelphia and New York, 1913. Pp. 325.

This is a work by a lawyer containing a simple statement of the legal position upon questions of interest to the physician. Such matters, for example, as malpractice, negligence, criminal liability, physicians as witnesses, the relation of the physician to the patient, etc. It is written in a simple, easy style, setting forth the various propositions in a brief succinct way with illustrative examples scattered throughout, which makes the whole quite readable, though of course of necessity it is more or less choppy in its general make-up. It is an excellent reference book upon the subjects discussed and contains references to the literature on each point so that the original sources may be consulted. In many parts of the book one would wish that it were much fuller, but as a reference work to get the latest decisions from it is of great value.

As regards the whole work, of course it is essentially the work of a lawyer. It sets forth all of the issues involved from the legal viewpoint. The more the physician learns of the legal viewpoint the more fully he must be convinced of the wide disparity between the lawyer and the physician and the need of more intimate relationships between them if they are ever going to come together in an at all practical way for the solution of the many problems that touch both professions.

ARBEITEN AUS DEM HIRNANATOMISCHEN INSTITUT IN ZURICH. Herausgegeben von Prof. Dr. C. v. Monakow. Heft. VI. J. F. Bergmann. Wiesbaden.

This present volume of Prof. v. Monakow's Arbeiten bears further testimony to the excellent work which his students are producing. Four articles are contained in this volume. Von Monakow opens with a short note on the value of central collecting stations where cerebral material can be gathered and worked up in accordance with the demands of modern technic. He speaks of the great value it would have been to neurological science were the preparations of Stilling, Deiters, Meynert, and many others still available and he urges that important series should be carefully preserved. He makes a special plea for the foundation of a Brain Investigation Institute for Switzerland.

Dr. Fuse, of Japan, gives a comparative anatomical, embryological and experimental anatomical study of the inner portion of the Meynert's Cerebellar Peduncle (I A K), called by Edinger the direct sensory cerebellar tract although it has not yet been shown that this is correct either as to function or as to location. In his historical summary Fuse gives a digest of some fifty separate studies of this region. As to his results we cannot attempt a summary as they do not admit of one. This excellent study should be read in the original.

Dr. R. Brun contributes a study to the study of degenerative foci in the medulla and the fiber tracts of the brain stem. It is a careful anatomical study of a complex and aberrant bulbar case from which he deduces a number of interesting localizing and clinical signs of considerable value.

Fuse has a further paper on the abducens nucleus of a number of mammals.

CRIMINAL RESPONSIBILITY AND SOCIAL CONSTRAINT. By Ray Madding McConnell, Ph.D. New York, Charles Scribner Sons, 1912. Pp. 339. Price $1.75.

This is an excellent little work on the subject of the relation of the criminal to society. It discusses at considerable length many philosophical and perhaps somewhat ultrascientific matters such as free will and determinism, but the viewpoint taken of these subjects is essentially common sense and practical. The whole attitude of the book is: we have the problem of the criminal on our hands; what is the best way to deal with it that will result in the greatest advantage all round. The work is distinctly pragmatic in tone and presents the conclusions of an advanced thinker in the field of criminology.

DIE APHASISCHEN SYMPTOME UND IHRE CORTICALE LOKALISATION. Von E. Niessl von Mayendorf. Aus der Psychiatrischenklinik zu Leipzig. Wilhelm Engelmann. Leipzig.

This is the latest large monograph devoted to the subject of aphasia. There are 454 large octavo pages, 51 figures and 7 tables. The many complexities of the aphasia situation are reviewed in great detail and the author weaves throughout the results of his own rich and carefully studied material.

He starts with the fundamental position that the word stations are to be found in the cortex and in those localities where the central pathways of sight, hearing and muscle sense have their endings. He thus distinguishes the three chief types of disturbance as Amnesia verbalis kinæsthetica, Amnesia verbalis acustica, and Amnesia verbalis optica. Amnesia verbalis kinæsthetica is due to a lesion in the lower third of the anterior central convolution, the speech pathway from here passing through the posterior portion of the external capsule, the posterior portion of the internal capsule between the pyramids and median lemniscus. The left third frontal convolution plays no rôle in the central mechanism of speech. The anterior central convolution is the locus of kinesthetic word pictures.

Amnesia verbalis acustica is due to a lesion of the middle portion of the first temporal convolution which with the transverse convolutions show marked cytoarchitectonic differences from all other portions of the temporal cortex. The understanding of written speech, of words, is a function of the cortical macula of the occipital lobes. No optic word center exists he thinks in the gyrus angularis.

The tables are particularly instructive, especially one which plots in colors the described localization of most of the available histories of aphasics in literature.

This is a most instructive and valuable volume which is entitled to serious consideration. It contains a most complete discussion of the entire aphasia literature.

GENETICS: An Introduction to the Study of Heredity. By Herbert E. Walter. New York, The Macmillan Company, 1913, pp. 272.

This work is an excellent presentation in a simple way of the problems of heredity and their application to man. Subjects such as variation, mutation, regression, blending, and the like are discussed at length and the chapters on these various subjects are replete with illustrations showing at a glance the meaning of the author. The book is in every way a creditable presentation of the subject and can be recommended to readers who desire a simple and short, but comprehensive survey of the field.

EXPERIMENTAL STUDIES OF MENTAL DEFECTIVES. J. E. Wallace Wallin, Ph.D. Warwick and York, Baltimore.

This is No. 7 of the Educational Psychology monographs edited by G. M. Whipple, and contains in compact form an excellent sizing-up of the Binet-Simon tests, particularly with reference to their use in epileptic material. It contains a short chapter on the use of the Binet-Simon scale, which will be found useful.

RELIGION AND CIVILIZATION. Dr. Wm. Hirsch, New York. The Truth Seeker Company, 62 Vesey St., New York.

Psychology, anthropology, archeology, philology, geology, and even astronomy have contributed their share to the raising of the veil in which the early years of history are shrouded. Dr. Hirsch has written a long volume full of narrative and early customs to show how much light may be thrown on the beginnings and growth of religion by understanding that branch of medicine devoted to the study of the diseased mind, namely, psychiatry. The day is past when it was thought that in order to get at truth one must deny either scientific facts or actual existence of people mentioned in the scriptures. The reverence with which the ignorant and faithful invested the written word of the Bible, as well as the accumulated writings of the Church Fathers, has made it difficult for scientists not to relegate all facts of Biblical history to the realm of myth and fiction.

But in this work we have a point of view which tends to prove by internal evidence that the characters of some of the founders of the Hebrew and Christian religions really existed, whether they conformed to the local descriptions in which they were embodied. Dr. Hirsch subjects Biblical characters to a so-called psychiatric analysis, and finds that many of the leaders, Abraham, Moses, Christ, for instance, must have existed, because the recorded peculiar mental beliefs concerning their own power, the revelations made to them, and the responsibility placed on them correspond so well to what Dr. Hirsch conceives to be the paranoid type of mind that to-day believe themselves to be divinely sent deliverers of the race.

The telling of the well-known Biblical tales with this explanation makes interesting reading to the elect, or sometimes even to the initiated who see no reason for contemptuous intolerance in the beliefs of any race. There is too much paranoia. The myths of the ages, cropping out in their Hebrew form, cannot be so easily explained. The author misses the broader psychological and historical background. While trying to prove that the circumstances surrounding the birth and claims of Christ were wholly imaginary, he yet uses phrases and points of view to prove ideas of grandeur as well as the hallucinations that lead him to classify Christ as a paranoic.

Now that the term paranoic is used as an adjective, indicating certain types of thinking, common to normal as well as abnormal states, and not as a hard and fast mental disease, we find Dr. Hirsch's work amusing, rather than fundamentally illuminating.

The progress of civilization of which religion is only an expression is dwelt on by Dr. Hirsch in a spirit of irritation and contempt, even intolerance. The contradictions, ignorances, and prejudices of the present supposedly enlightened age are criticized by him in terms of quite analogous contradictions, ignorances and prejudices. He would abolish all religion, which he calls inefficacious, and substitute for it, what he terms an ethical education. But just as he confuses symptoms with disease, and world myths with fabrications, so he speaks of religion as an entity, rather than an attitude of the human mind.

Doubtless, however, there are many who will be stimulated to thought by the striking, and somewhat irrelevant way in which he shows up the inconsistencies of much so-called religious conduct.

On the whole the work is far from sound. It is not written from the attitude of a student who would try to get in touch with his subject and endeavor sympathetically to understand it, but seems to show a paranoid projection of an internal grouch. It is a work in which the author vents his own subjective spleen towards the forces about him. Had he the making of this world it would be a great advance over what the canaille have done. How close this paranoid attitude is to those described and deprecated will stand out prominently to the reader of this book.

JELLIFFE.

THE REAL CAUSE OF STAMMERING AND ITS PERMANENT CURE. By Alfred Apelt, Principal of the Institute for Stammerers, Goldington, Bedford. Methuen & Co., London. 3sh. 6d.

The trainer or teacher of stammerers usually has to "deliver the goods" if he would survive. He cannot hide behind some mysterious "force" as the psychiater may. The results of treatment are usually good but are often insecure, and refractory cases appear. It is therefore no surprise that the far-reaching method of psychoanalysis should be called into service. The wonder might better be expressed that it had not been before. Fortunately Dr. Apelt has here presented it in its application to stammerers and in English dress.

We welcome this short yet brilliant and useful treatise. It teaches methods for permanent cure.

GRUNDRISS DER PSYCHIATRISCHEN DIAGNOSTIK. Von Prof. Dr. Raecke. Dritte Auflage. August Hirschwald, Berlin.

This short compend of 186 pages gives an excellent pocket-size book for the study of psychiatry. We have had occasion to commend it in previous editions. This new one has been enlarged, making it a very acceptable short work for the study of the chief psychoses.

THE KALLIKAK FAMILY. A Study in the Heredity of Feeblemindedness. By Henry Herbert Goddard, Ph.D. The Macmillan Company. 1912. $1.50 net.

Dr. Goddard has here recorded a unique experiment. It might almost be termed a freak experiment, and Dame Nature was the experimenter. A certain Martin Kallikak about 1837 married. He was normal, as was also his wife. Their descendants, as traced by Dr. Goddard for six generations, several hundred in number, were all normal. But Martin strayed from the straight and narrow path and had a child from a feeble-minded girl. The descendants along this line in about the same number of generations living in the same state, same environment, brought forth 222 feeble-minded children in 41 matings. Just what the details were, and they are intensely absorbing and valuable for all students of heredity, must be found in the original, which should be in every physician's office, we might add on his reading table in the waiting room.

JELLIFFE.

DIE MIGRAINE. Von Edward Flatau. Julius Springer, Berlin. 12 Marks.

This is volume 2 of the monograph series of Alzheimer and Lewandowsky. It is the best recent monograph on migraine. There is a short historical introduction, some 12 pages on etiology, 120 pages on symptoms, 40 on pathogeny, 5 on diagnosis, one on prognosis and 11 on therapy. Heredity is made to play the chief rôle in the causation. As we have tried to show in a study of a large group of migraines (Osler's Modern Medicine) heredity is so universal that it ceases to play any rôle. Flatau has accepted the older opinions without making any new studies. The confusion has arisen from neglecting to take the abortive and atypical migraines into consideration in the study of this protean malady. Classical attacks play a minor rôle in migraine and hence should not be the basis upon which hereditary dicta are founded.

The symptomatology leaves nothing to be desired. It is a vade mecum.

Flatau comes to the same conclusion as the reviewer in the article quoted, that migraine is a syndrome of varied causation, and lays special weight upon the pathological neurometabolic processes in which toxic factors of endrocrinous origin play a predominant rôle. The headache is a result of a disturbance in the brain mechanics largely in the sense of Quincke's angioneurotic hydrocephalus with vascular spasm.

This is a very excellent monograph.

JELLIFFE.

LES IDÉALISTES PASSIONNÉS. Par le Dr. Maurice Dide. Médecin en chef des Asiles. Felix Alcan, Paris.

The author here purposes to study a certain group of abnormal individuals which he arbitrarily designates by the title of his book. He groups them according to their psychological affinities and believes this to be a better synthesis in order to understand the deviations of the mind, than is obtainable when they are disseminated in different chapters in a psychiatry. He first defines idealism following the philosophic series through Anaxagoras, Plato, Descartes, Berkeley and Schelling. The affective life is the origin of every tendency towards the ideal, and it is among the inclinations that one finds the idealistic tendencies.

The author discusses the idealism of love both profane and modern; the idealism of goodness, and finally the idealism of beauty and of justice, with a final word on vindication or cruelty.

It is all very well done, but one misses real clinical suggestions or hints that definite material has contributed to the making of this charming essay.

UEBER NERVÖSE ENTARTUNG. Von Prof. Dr. Med. Oswald Bumke. Julius Springer. 5.60 Marks.

This is the first number of a new monograph series issued by the *Zeitschrift f. d. gesammten Neurologie und Psychiatrie* and edited by Alzheimer and Lewandowsky. Subscribers to the *Zeitschrift* can purchase the monograph for 4½ Marks.

The present volume is 116 pages. It is a comprehensive review of the degeneration problem; a problem of great age and interest, especially as it unfolds in the field of psychiatry. The word and idea existed long before Morel raised it to a cult. Rieger in his aprioristic way has said that "Degeneration is only a declamatory phrase." Rieger's attitude would seem to be more than justified in view of the widespread misuse of the term as well as the idea. Bumke quotes Walton's excellent suggestion of introducing the word deviate instead of degenerate. Bumke here adopts a criterion that degeneration signifies an increasing vitiation of the species from generation to generation, resulting in a useless deviation from the type. In the psychiatric sense the deviation refers to the health of the mental life.

Bumke raises the question whether nervous degeneration can take place with heredity and particularly of the heredity of acquired characters. This latter he takes up in a second chapter and comes to a negative conclusion.

A third chapter deals with nervous and mental heredity. It gives a fairly complete summary of the older literature but has little of the English or American work, much to the detriment of the monograph, for the best actual hereditary studies are from Galton and his followers in the eugenic movement. Bumke has missed an opportunity in not rounding out this chapter from the actual field work accomplished. The bibliography is rich in citations, but contains only a few of the names of actual vital workers in the problems under discussion. Taken all in all the study follows old lines too closely and is not up to standard although containing much of value.

JELLIFFE.

L'AFFAIBLISSEMENT INTELLECTUEL CHEZ LES DÉMENTS. Dr. G. Revault d'Allonnes, Agrége de Philosophie, Docteur ès lettres. Félix Alcan. Paris.

The present-day tendency to regard dementia as a general process, rather than a specific one, is here wisely reflected. Although psychiatry has not yet entirely purged itself of such generalizations; although one still hears of primary and secondary dementias, and the law courts still reverberate with the century-old notions of "dementia," yet there is hope that the unitary psychosis, dementia, may finally be abrogated from psychiatric literature and thought.

Mild or severe intellectual loss, particularly as it occurs in senility, in paresis, and in schizophrenia is the goal of the author's present study. Thirty patients were studied from the standpoint of what the author has denominated the modalities of mental mobility, viscosity, slowness in reaction, attention time, loss of direction, incontinence of activities, emotions, speech and ideas.

He establishes six grades of a mental defect among these patients who nosologically represent senile psyschoses, paresis, and schizophrenia—

according to Ballet's Kraepelinized categories. His "cubage intellectual" mensurates according to these degrees. The first he terms partial disintegration of working capacity—especially in lack of initiative, of combining power; the second degree consists of a total loss of the working capacity; the third consists of a total loss of the working capacity plus a partial disintegration of verbal objective activity; a fourth consists of the former three plus partial loss of subjective ideation; a fifth of the fourth with total loss of subjective ideation; while a sixth consists of the total loss of the entire psychic life.

The work makes an interesting attempt at providing a rough and ready scale for measuring different grades of mental loss.

LES PARATHYROÏDES. Par Louis Morel. Libraire Scientifique. A. Hermann & Fils. Paris.

The author has filled 340 pages of a good size in detailing our present day knowledge of the parathyroids, and there is no padding, no repetition but straight-away material of the best type. It has both German thoroughness and French brilliancy and is the most desirable monograph on the parathyroids extant. The price is only 10 francs.

JELLIFFE.

LE LANGAGE ET LA VERBOMANIE. Essai de Psychologie Morbide. Par Ossip-Lowrié. Félix Alcan. Paris.

This series of lectures delivered before the University of Brussels is entertaining if not profound. He would trace primitive language from cries and gestures as many have done; beyond this he does not go. Why even cries and gestures arose is not touched upon and a dynamic or genetic explanation is conspicuous by its absence, yet the general scheme is sound as far as it goes The pathological feature of the situation takes up the subject of too much talky-talk. Such a work is certainly needed and should be translated into every language. Whether this one fills the bill is questionable as it is not sufficiently convincing in its fundamental psychology. Verbomania in women is an instructive chapter. That on the prophylaxis of verbomania in childhood is practical and suggestive.

VORLESUNGEN UEBER DEN BAU DER NERVÖSEN ZENTRALORGANE DES MENSCHEN UND DER TIERE. Von Prof. Dr. Ludwig Edinger. Erster Band. Achte Auflage. F. W. C. Vogel. Leipzig.

No work on the structure of the nervous system has enjoyed the wide popularity of these lectures of Edinger. They are now in their eighth edition. In spite of the many intricacies which modern technical studies have introduced Edinger's work still retains its simple logical character and broad general grasp of the main anatomical features of practical importance to the neurologist.

Entirely new chapters are here introduced for the first time. There is a complete presentation of the autonomic sympathetic system and the cerebellum chapter has been greatly remodeled. The evolutionary, comparative anatomy viewpoint is kept to resolutely and a fitting close to the work is an attractive chapter on psychology as viewed from the anatomic-physiological viewpoints.

JELLIFFE.

a rapid succession of hallucinations may be too much abstracted to pay attention to corporeal needs. The illusional interpretation of sensations from the digestive tract'is a frequent cause of the psycho-somatic refusal, and painful conditions about the mouth as stomatitis, angina and painful teeth should always be looked for. Lastly organic causes such as paralysis of the throat muscles may furnish a cause of refusal. (Idiots and deeply demented patients refuse food apparently from mere lack of initiative, but will swallow it if it is placed in their mouths (Ref.).) While the causes of food refusal may vary from time to time in the same patient, hence exact figures cannot be given, the author in a study of 87 cases which had to be forcibly fed, traced refusal of food to delusional ideas, in 39 cases (7 general persecutory, 13 of poisoning, 9 of unforgivable sin, and 10 hypochondriac), in 24 cases, to inhibition either with depression or as katatonic stupor, in 8 cases to severe mania, in 7 cases to the influence of hallucinations, in 4 cases to stubbornness, in 2 cases to suicidal intent, and in 3 cases to somatic troubles (twice pneumonia, once intestinal tuberculosis). Of clinical types, dementia præcox stood at the head, with 35 cases of food refusal. There were 16 instances in hallucinatory confusional conditions, 11 among the senile dements, while 8 melancholics, 2 maniacs, 5 paranoiacs, 7 imbeciles, 2 idiots and 2 hysterics had to be forcibly fed. Refusal lasted from a few days to 8 months. All the cases in which it lasted over two weeks belonged to the class of dementing psychoses. In the treatment of refusal of food the cause should be first carefully looked into, and removed if possible. Persistence and tact upon the part of the attendants succeed in many cases. Tube-feeding is indicated when other measures fail, though its dangers are not to be forgotten. As to when to begin with it, the weight and general condition of the patient and especially the state of the circulation will give important indications. Of value is the presence of acetone in breath and urine. It is generally stated that a patient can be allowed to go 5 or 6 days, or if he remains quiet, longer, before resorting to the tube. Much depends however upon individual conditions and too long delay may be dangerous. Feeding may be intermitted occasionally and the patient given a chance to eat spontaneously. Liquid nourishment, of which milk forms the chief element and to which wine or spirits, or drugs indicated, can be added, must be our reliance in tube feeding. To prevent scurvy, in long continued tube-feeding vegetable juices or soup must be added. Nutrient enemata have little value in the psychoses on account of lack of coöperation on the part of the patient. The author prefers the nasal tube.

4. *Phatasy and Weakmindedness.*—History of the case of a criminal imbecile, with unbounded phantasy, sent to Dalldorf for observation after a number of offences. After extended observation and examination, the author certified the case as one of high degree of defect in the ethical and intellectual spheres with morbidly exaggerated impulses and phantasy, hence unable to properly appreciate the consequences of his acts and irresponsible under the law. The patient was acquitted of the offense charged and sent to an asylum.

5. *The Royal Asylum for Children at Gross-Hennersdorf.*—Of local interest only.

C. L. Allen (Los Angeles).

(Vol. 69, Heft 4. 1912)

1. The Zwiefalten Asylum in Wurtemburg. A. SCHOTT.
2. Lung Disease Station at Zwiefalten. Dr. KRIMMEL.
3. Family Care at Zwiefalten. DR. GUTEKUNST.
4. Three Cases of Late Recovery. DR. KREUSER.
5. Psychopathic Defective Criminals and German Criminal Code. DR. STAIGER.
6. Defective Children in Wurtemburg. A. SCHOTT.
7. Contribution to Study of Querulant Insanity. DR. BUDER.
8. General Paresis in Alsace Lorraine. H. JOACHIM.
9. Acute Psychosis from Veronal. HANS LAEHR.

1. *The Zwiefalten Asylum in Wurtemberg.*—In June, 1912, this institution celebrated its hundredth anniversary. Descriptive and reminiscent. Of local interest chiefly.

2. *Lung Diseases at the Zwiefalten Asylum.*—Of local interest only.

3. *Family Care and the Zwiefalten Asylum.*—In 1896, the authorities at Zwiefalten commenced boarding out suitable patients among the families in the neighborhood, from which time to 1911 191 patients (100 women and 91 men) have been so put out. The author thinks the experiment upon the whole a success, embodying his experiences in the following conclusions. Conditions for the development of family care are very favorable in the neighborhood of Zwiefalten. Family care has so far justified all expectations and has proved a valuable addition to measures for the care of the insane. On account of external conditions, family care so far has been inadequate to relieve the institutional overcrowding. Results attained up to the present time encourage us in the attempt to cultivate and to enlarge what has proved a measure capable of good for the patients.

4. *Three Cases of Late Recovery.*—(1) Man of about forty years old, after severe mental overwork, neurasthenic depression later melancholia, then mania with at one time slight katatonic symptoms. Recovery after 4 years. (2) Man of fifty years old after severe mental strain developed an acute confusional condition, later severe mania with decided paranoid traits and mannerisms suggesting a dementing process. After seven years duration, recovery. (3) Woman forty-eight years old, first depression then mania, with a picture much like that in the first case. After seven years recovery.

All of these cases came from good families and the psychosis occurred in middle life. In only one was there hereditary predisposition. All presented some of the signs usually considered of unfavorable prognostic import, as obstinacy, apathy, unbounded phantasy, mannerisms and stereotyped repetition of senseless peculiarities with confusion in the mental products. Nevertheless all were able to take their places in society again and have remained well for some years.

5. *Psychopathic, Defective Criminals in the German Criminal Code.*—It is fashionable to-day to demand special institutions for mentally deficient criminals who are undergoing confinement. The author takes the other side and presents good arguments in support of his contention that such criminals can be more efficiently and better cared for in a corrective institution, especially if it is provided with a department in which the feeble in body and in mind and the stronger psychopaths, epileptics, etc., while they are undergoing a period of disturbance can be kept. He de-

plores the tendency to give such people short sentences, since the term of confinement is not only for corrective punishment but should be utilized as a time for improving the patient's mental and physical condition by suitable treatment, which naturally takes considerable time. As against collecting a number of such subjects in a special institution, he objects that since the majority are not insane, but on the contrary sharp-witted, their ability to plot constantly to escape and their general opposition to discipline makes it imperative to manage such an institution rather like a penitentiary than like an asylum. Neither should they be ordered sent to a regular insane asylum after serving their sentences, since although often incapable of keeping out of trouble, they are not insane and should not be inflicted upon an institution for the mentally ill. He favors for this class the indeterminate sentence, their stay in the institution being made dependent upon their possibilities for improving and demonstrating that they can at length live in the world without being a menace to the peace of the community.

6. *Defective Children in Würtemberg.*—Some remarks upon what is being done in Würtemberg for this class with an account of some personal examinations of children in the Schoenbuehl Asylum. What is needed from the psychiatric point of view he thinks is (1) The opportunity of examining all the children of this class and keeping them under observation. (2) The establishment of elementary courses in psychiatry for the personnel of the "Rescue-Asylums." (3) Courses in the medical jurisprudence of insanity, etc., to be given by criminologists and penitentiary physicians, for lawyers, physicians and the managers of "Rescue-Asylums." (4) The establishment of an observation ward for children of both sexes belonging to this class, this to be under psychiatric management.

7. *Querulant Insanity.*—The querulants have generally been classed as paranoiacs, though Specht considers them as belonging rather to the manic depressive group while Bonhoeffer, Willmans and others consider querulantism as a special development due to circumstances in a previously abnormally constituted individual. The author describes the case of a man of middle age who has developed a typical system of delusions of persecution and spent his substance in processes and in paying fines for contempt of court, the whole commencing with the cutting off of a weekly stipend being paid him for an injury to the head of some severity, through the testimony of a magistrate who certified that he had recovered. This man after spending some time in the asylum was liberated but had to be returned. He then developed a number of phantastic delusions of grandeur which, though otherwise he showed no dementia, causes the author to hesitate as to whether he should be classed as a true paranoiac or as a case of dementia paranoides, the latter group tending continually to gain at the expense of the former and doubtless containing a certain number of querulants.

8. *General Paresis in Alsace-Lorraine.*—There has been a tendency to assume that general paresis has very materially increased in frequency in the last few decades, though statistics which would indicate the opposite have not been wanting. The author has studied the admissions to the Alsatian Asylum, Stephansfeld, between 1872 and 1910, to the Lorraine Asylum, Saargemund, from 1898 to 1909 and to the Strassburg Psychiatric Clinic from 1897 to 1909 (excluding the cases afterward transferred to Stephansfeld) and has arranged his figures in a number of tables and curves.

The following conclusions are drawn. (1) In the case of the male paretics there is a gradual decrease in number in proportion to the total admissions; (2) There are certain slight changes in the distribution of paresis by districts; (3) There is some slight tendency to extension of paresis among the lower industrial strata of society; (4) It has increased more among the single than among the married; (5) The duration of the disease seems to have slightly increased; (6) Potus appears less frequently as an etiological factor in the histories. (7) As to form, the dementing type is more and more preponderating over all others. (8) Paretic seizures are becoming less frequent. (9) Remissions are more frequent; (10) Tabes is more frequently combined with general paresis than formerly.

9. *Acute Psychosis after Chronic Veronalism.*—Case of a 53-year-old woman who had used veronal habitually for six and a half years and during the latter part of the time medinal. On the withdrawal of the drug she developed an hallucinatory confusional condition somewhat resembling acute alcoholic hallucinosis, which after persisting about 8 days subsided rather suddenly, though traces of the hallucinations recurred for some time. As physical symptoms, there were, during the attack, muscular pains and paresthesia with loss of knee-jerk, also tremor and muscular unrest. The author explains at some length his reasons for excluding alcohol from the etiology of this case and points out the differences between the phenomena observed and those of alcoholic delirium. He finds in the literature no other case of veronalism which presented such acute symptoms.

C. L. ALLEN (Los Angeles).

Neurologische Centralblatt

(Vol. 29, No. 7)

1. Tumor of the Cerebello-Pontile Angle. H. OPPENHEIM.
2. Recurring Pseudo-tumors of the Brain. H. HIGIER.
3. Myelin Sheath Stain in Frozen Sections. W. SPIELMEYER.

1. *Cerebello-Pontile Tumor.*—Oppenheim reports a case of cerebellopontile tumor in which were found the interesting and important symptoms of involvement of the motor and sensory tracts opposite the tumor, viz., motor and sensory symptoms on the same side of the body as the cranial nerve symptoms and the ataxia. This was explained by the tumor mass crowding the pons and medulla against the bone on the opposite side. The case finally came to necropsy and the diagnosis confirmed and in addition the pressure against the vertebral artery had caused a deep groove in the side of the medulla. Oppenheim also remarks that a positive Wassermann and favorable results from mercury often lead to errors in the diagnosis of brain tumors. He states however that he has never seen a case of a gumma which presented the typical symptoms of an acousticus tumor.

2. *Pseudo-tumors of Brain.*—With a review of the literature, the author presents the histories of two cases of recurrent pseudo-tumor of the brain. He emphasizes the difficulties of making a diagnosis, and does not attempt to explain the pathology of this condition.

3. *Myelin Sheaths.*—The usual methods of staining myelin sheaths in frozen sections of nervous tissue, especially cerebral cortex, have not been entirely satisfactory, and Spielmeyer describes a method by which

he has obtained good results although it is often necessary to repeat the process on a given specimen one or more times for the best results. The reader is referred to the original article for the details of technic.

(Vol. 29, No. 8)

1. The Origin of the Levator Palpebræ Superioris and its Alleged Relation to the Cerebral Cortex. A. Wallenberg.
2. Section of the Posterior Spinal Roots in Tabes. G. Mingazzini.
3. The Distinction between Functional and Organic Sensitiveness to Pressure. C. Hudovernig.
4. Localized Vertebral Tenderness in Cardiac Neuroses. M. Friedmann.

1. *Levator Palpebræ.*—A patient suffering from a hemiplegia (right) presented also ptosis of the right eyelid and inactive pupil. At necropsy two lesions were found, one large area in the left cerebrum and a very small area in the right oculomotor nucleus. This was to be expected as the symptoms could not be explained by one lesion in the cerebral cortex as was once supposed by Landouzy and Grasset.

2. *Tabes and Spinal Roots.*—Referring to the operation of posterior root section in tabes Mingazzini recalls the fact that he proposed this method as early as 1899 for the severe pains not controlled by other means.

3. *Functional Tenderness.*—Mannkopf's symptom is well recognized and is characterized by an increase in pulse rate from pressure over painful areas in functional nervous diseases. The author has examined some 35 cases in which there were painful areas from an organic basis and without symptoms of neurosis. In over 90 per cent. of these cases he found that pressure on the painful spots caused a slowing of the pulse rate from 10 to 20 beats per minute. He recommends this test as a means of distinguishing functional from organic conditions.

4. *Vertebral Tenderness.*—Friedmann describes a symptom which he has found in about half of the cases of cardiac neuroses and but seldom in organic heart disease. It consists of a distinct tenderness in the third dorsal vertebra and sometimes to a less degree in the second and fourth. The adjacent parts are not sensitive, but there is frequently tenderness also in the precordium as well as spontaneous pain.

(Vol. 29, No. 9)

1. Total Hemiatrophy. E. Meyer.
2. A New Symptom in Tabes Dorsalis. H. Haenel.
3. The Treatment and Theory of Bromism. R. Laudenheimer.

1. *Hemiatrophy.*—A case of hemiatrophy is reported in a man of 37 years who was perfectly normal until about ten years ago, since when the condition has gradually developed. The points of interest in the case were the mental deterioration, muscular atrophy, principally on the left side of the body, great motor weakness with increased tendon reflexes, spontaneous pains and paresthesias, absence of sweating, reduced temperature, and hypesthesia, all limited to the left side of the body. This condition is in some respects similar to the atrophy seen in some cases of hemiplegia with gross lesions; in other respects it resembles the so-called tropho-neuroses; but it differs in important points from both these conditions. Its gradual prolonged course distinguishes it from the former,

the mental loss and spastic paresis from the latter. To explain the symptoms the author suggested the possibility of a diffuse process, probably encephalitic in character, affecting a large area in the right side of the brain.

2. *Tabes.*—A new symptom is described which is frequently present in tabes. It consists in a loss of the sensibility of the eyeball to pressure, analogous to the loss of testicular pain. It is explained on the hypothesis of involvement of the cervical sympathetic since it is not produced by lesions of the fifth nerve or even by excision of the Gasserian ganglion.

3. *Bromism.*—From a series of experiments to determine the effect of the administration of sodium chlorid on the excretion of bromine as well as upon the symptoms of bromism, the author concludes that the effect is positive and that the excretion of bromine is much greater as the result of the intake of fairly large quantities of sodium chlorid with bromid dose unchanged. The author thinks that the improvement in the symptoms of bromism is at least due in part to the bromid elimination and not entirely to supplying a deficiency in chlorids, as some authors have assumed.

(Vol. 29, No. 10)

1. Can Actual Anomalies of the Cerebral Surface be Produced through Atrophy? P. Näcke.
2. Concerning the A. Westphal Pupillary Disturbances in Catatonia, and the Pupil Unrest and Sensory Reaction in Dementia Præcox. F. Sioli.
3. A New Foot Reflex (Malleolar Reflex). E. Trömner.

1. *Atrophy and Cerebral Anomalies.*—This article consists principally in an answer to the adverse criticism of his Brain Atlas by Ranke and and a justification of his stand denying the inference of Ranke that anomalies of form can be caused by atrophy of the brain cortex as in paresis.

2. *Pupils in Katatonia.*—In 1907 A. Westphal described the pupillary disturbances which he observed in a case of catatonic stupor consisting of transient loss of the light reflex and changes in outline, round to oval and the reverse. These disturbances he considered not as reflex changes but as disturbances in the innervation of the iris, which view was later supported by his observation of the intimate relation between these pupillary symptoms and the condition of general muscular rigidity of the patient. Sioli reports five cases in which the typical pupillary symptoms were found, some of which had shown similar conditions in the early stages of the psychosis. He also noted that sometimes the right pupil, sometimes the left was rigid in the same patient; the rigid pupil failed to react consensually although the opposite one reacted both to direct and consensual illumination. To determine the value of pupillary unrest and the sensory and psychic reactions, Sioli examined 25 normal individuals, 70 insane cases; from them he concluded that these signs are always present normally, although the stimuli necessary to produce the psychic and sensory reactions vary greatly. Of 40 cases of dementia præcox these signs failed in 37. In manic depressive cases they were always present.

3. *Foot Reflex.*—Trömner describes two new foot reflexes which he calls malleolar reflexes, internal and external, and which are elicited by tapping the internal or external malleoli, producing contractions of the peroneus longus or the tibialis posticus respectively in favorable cases. He has found these reflexes present in many cases of early motor tract

disease, and in some cases of unilateral brain disease where all other reflexes were symmetrical. It is especially valuable in recent lesions and generally disappears with the development of contractures.

(Vol. 29, No. 11)

1. Endogenous Factors in the Etiology of Paresis. E. Schroeder.
2. Contribution to the Subject of Tumor of the Cerebello-pontine Angle. Otto Marburg.
3. The Sexual Criminal. Otto Juliusburger.

1. *Paresis.*—Schroeder makes a plea for the more careful study of paretics from the standpoint of preëxisting signs of degeneracy as potent predisposing factors in its etiology. From personal observations and from the literature he cites statistics which show either bad heredity or neuropathic constitutions exist in a large percentage of paretics.

2. *Cerebello-pontine Tumor.*—Marburg contributes the report of a case of fibroma at the cerebello-pontine angle similar to the case reported by Oppenheim in the *Centralblatt* in April, 1910, in that the Wassermann reaction was positive in the absence of any signs of syphilis.

3. *Sexual Criminal.*—Juliusburger, in this article, reviews the work "Der Sexualverbrecher," by Erich Wulffen.

(Vol. 29, No. 12)

1. Additional Experiences with the "Leg Phenomenon" in Tetany. Hermann Schlesinger.

1. *Tetany.*—Schlesinger has collected the reports of nineteen cases of tetany in which his "leg phenomenon" has been tested and states that it was positive in eighteen of them. The test consists in flexing the extended leg on the pelvis with the patient in the dorsal position. In from a few seconds to three minutes extensor cramp with pain develops, which sometimes extends to the opposite leg. This test is analogous to Trousseau's sign, but is more constantly found, according to the author. It has not been seen in any condition except tetany, and is therefore considered pathognomonic for that condition.

(Vol. 29, No. 13)

1. Insight Obtained through Introspection in Certain Mental Conditions. P. Näcke.
2. Demonstration of a Dog from which Both Temporal Lobes had been Extirpated. Walter B. Swift.
3. Critical Remarks on the Practical Value of the Wassermann Reaction. Toby Cohn.

1. *Introspection.*—Unsuitable for abstract.

2. *Temporal Lobes.*—Swift refers to the experiments of Kalischer, Rothmann and Jacobsohn, in which the temporal lobes were removed from the brains of dogs, and proceeds to offer another contribution to the subject. In one of his experiments both temporal lobes were removed from the dog which was then found to be apparently deaf, but after seventeen days reacted to two tones in the same manner to which it had been trained before the operation. From this the author concludes that extratemporal portions of the cortex are concerned in the reaction but makes no attempt to more accurately localize them.

3. *Wassermann Reaction.*—Cohn, in discussing the practical value of the Wassermann reaction, calls attention to some of its inconsistencies, as for example the different reports given by different observers in testing the same specimen of blood; and again, as in the cases of Oppenheim and Marburg, the presence of positive Wassermann reaction in cases of brain tumor where there are no signs or history of syphilis.

INGHAM (Phil.).

Deutsche Zeitschrift für Nervenheilkunde

(Band 44, Heft. 5 and 6)

1. Two Genealogical Trees of Ataxia. FREY.
2. Albumin and Xanthochromia in the Cerebrospinal Fluid. RAVEN.
3. Pathology of the Cerebro-spinal Fluid. MOHR.
4. Criticism of the Methods of Psychotherapy. VOGT.

1. *Hereditary Ataxia.*—An interesting study of twelve generations in one family tree and several in another.

Consanguinity played an important rôle. Predisposing causes in the parents as well as pregnancy, labor and syphilis played no important part. Tuberculosis was widespread in one of the branches, in which the father, 4 brothers, and several children of one of his sisters showed ataxia. Affections of the brain, and psychic disturbances were quite prevalent in this genealogical tree. Abortive or transitional forms of ataxia were common.

In the tenth and eleventh generation the tendency to extinction of the family was noted.

2. *Albuminuria and Xanthochromia.*—The author studied the value of the albumin test without lymphocytosis, in the cerebro-spinal fluid (Nonne's test for spinal tumor). He analyzed 47 cases coming to section or necropsy, 20 cases occurred in Nonne's service. He concluded as follows:

Albuminuria with absent or only slight lymphocytosis indicated a compression of the cord. The cause of the compression could not be determined by this test. The syndrome could be present in intramedullary tumors. The albuminuria occurred through stasis of the fluid below the site of the compression.

Xanthochromia resulted from the hemoglobin. Its presence with the other syndrome strengthened the diagnosis of compression. A meningomyelitis and fresh hemorrhage must first be excluded to render the test valuable.

3. *Cerebro-spinal Fluid.*—Report of a case of spinal tumor in which a study of the cerebro-spinal fluid showed tumor cells.

4. *Psychotherapy.*—A resumé of the methods and fundamental principles used in psychotherapy.

Vogt defines psychotherapy as that therapy which, refraining from the influence of corporal effects, seeks rather to use the influence of psychic effects. Many methods are used two of which stand out sharply—the hypnotic-suggestive method (Forel-O. Vogt) and the educational-persuasive method (Dubois); but, as Isserlin states, "Psychotherapy embraces all."

In the hypnotic-suggestive method, a sleeplike or hypnoid state is produced, in which ideas, internal or external, predominate, so that they have a strong after effect. The state is characterized by the elective attention and the persistent solubility of the memory.

Forel's states of hypnosis are given and the writer discusses the import of hypnotic influence, its technique, and how far it affects processes not controlled by the will. Hypnosis is used to produce sleep, as a method for suggestion, and as a means to effect hypermnesia.

According to Vogt, the kernel of hypnosis is suggestion. In order to practise suggestion we must hypnotize. Isserlin's conception of suggestion is given and the writer discusses suggestion during the waking state, auto-suggestion, and similar related states. By larval suggestion he understands the psychic effects produced by physical and chemical means. Simple and waking suggestion occur naturally during talking. Lippman's method of suggestive questions is also mentioned. By the suggestive method a deviation from the idea can be produced as well as direction toward it.

The educational and persuasive method is a later development of psychotherapy. Oppenheim, Dubois, Dejèrine, etc., have been the chief advocates of this method, while Dubois has developed it to an extreme degree.

According to Dubois, the psychoneuroses show purely logical intellectual defects. For him, the disease is a kind of mental enfeeblement, the cardinal symptoms of which are increased suggestibility, fatiguability, and sensory and emotional excitability. Cure can be effected through discussion of the symptoms and their causes. Vogt states that the emotional process can not be excluded during the treatment, nor need it be secondary to the intellectual, as Dubois considers.

Finally, psychoanalysis, the latest development in the field of psychotherapy, is considered. The theoretical and practical principles of the cathartic method of Breuer and Freud are discussed and sharply separated from the later method of Freud. This latter he calls sexual analysis. It begins with Freud's work on the Angst Neurosis. In the neurosis, the nervous system reacts to an internal effect analogous to the emotion which is produced by an external excitement. Vogt describes in detail Freud's conception of its production.

He believes that Freud's theories are one-sided and quotes the views of Isserlin and Oppenheim.

S. Leopold (Philadelphia).

Monatsschrift für Psychiatrie und Neurologie

(Vol. 31, Supplement. June, 1912)

1. The Sensory Disturbances from Interrupted Circulation. H. Fabritius.
2. The Psychology of Youthful Criminals. G. Major.
3. Studies Regarding "Senile Plaques." G. Marinesco and J. Minea.
4. Contribution to the Etiology and Clinical Position of Migraine. M. Ulrich.
5. Nervous Disorders following the Mülheim Railroad Disaster of March 30, 1910. P. Riebel.
6. Protracted Affect-Variations and Ecnoic States. M. Bresowsky.
7. The Differential Diagnosis of the Meningo-medullary Luetic and Tuberculous Affections. P. Ciuffini.

1. *Sensory Disturbances.*—Careful studies were made upon the disorders of sensation occurring in limbs or fingers which were constricted by rubber bands. A few of the conclusions follow. Our knowledge of the

position of a member depends upon sensations in the member itself and upon muscle contraction. The former are much more delicate. By the constriction of a finger or hand a disturbance of peripheral sensibility results which inhibits the ability to recognize objects by palpation, in spite of preservation of touch, pressure, pain and temperature sense.

2. *Youthful Criminals.*—A statistical resumé of crime among children, a dissertation on the causes of youthful criminality and a commentary on the inadequacy of our present methods of dealing with the situation.

3. *Senile Plaques.*—An historical review divides the discussion of this subject into three periods. The first followed Redlich's publication, in 1898, of two cases of senile epilepsy in which he found "miliary scleroses" and attributed them to a neuroglia reaction, possibly replacing ganglion-cells. A few other observers noted the same lesions. The second period began in 1906 with Alzheimer's studies of tissues stained by Bielschowsky's method. This method showed a peculiar degeneration of the nerve-cells in that their fibrils became knotted and looped and after the entire disappearance of the cell this "snarl" of fibrils would be the only survivor. The condition occurred before the actual senile period and in cases which bore no signs of paresis, syphilitic or arteriosclerotic disease. Alzheimer regarded it therefore as a process previously unrecognized. The third period began with the investigations of Fischer in 1907, who reached the conclusion that the "miliary necroses" were pathognomonic of presbyophrenia. He examined twelve senile brains besides numerous controls. The plaques were always present in presbyophrenia but usually absent in simple senile dementia. They were never found in paresis, in other organic and functional nervous diseases, or in normal brains. His further studies among a much larger number of cases gave the same results. Many other histologists published observations subsequently. Hübner regarded the plaques as deposits of degeneration products from destroyed fibrils. He found them in other diseases than senile. Perusini determined the first stage of the plaques to be an alteration in the protoplasm of the glia reticulum. A characteristic alteration in the nerve cells was also present. The condition was not peculiar to presbyophrenia. Perusini contends that the plaques do not originate in nerve cells. The author's material consisted of two cases, the first, a woman of 54, showed a variety of disorders, pseudo-bulbar paralysis, apraxia, agraphia, alexia and a mental state of dementia, disorientation, extreme lability of mood. The brain showed numerous small foci of softening in the basal nuclei. Small vascular lesions were seen in the cortex, on the surface and in medulla and pons. Microscopical examination was made by means of the method of Bielschowsky and that of Cajal. The plaques were found chiefly in the occipital portion of the right hemisphere. They did not occur anywhere except in the cortex. The second case was a woman of 107 years, concerning whose clinical history no data were obtainable. The plaques were more widely distributed than in the other case but, as in that, were found only in the cortex. The nature of the plaques and their histological structure is given in detail and excellent drawings accompany the text. The first phase in the formation of the plaques is a deposit of a colloidal substance from the circulating lymph, which acts on the nervous tissue probably simply mechanically and produces a sharp neuroglia reaction. The second phase is a reaction on the part of the nerve fibers which show a marked swelling which later becomes the central body of the plaque. In the third phase, through increasing deposits and through growing in

of new cells and fibers, the plaque enlarges. A proliferation of neuroglia occurs about the periphery and by some process, possibly by a secretion which dissolves it, the deposited substance is made to disappear and a limit is thus set to the growth of the plaque. Correlation of clinical symptoms with the occurrence of the plaques is difficult to determine. The authors do not believe that the plaques are a part of normal senile involution.

4. *Migraine.*—The principal causes of migraine as advanced by various authors are (1) Primary, inherited degeneration of the nervous system; (2) intoxication and autointoxications of all sorts; (3) reflex action from the various organs (eyes, genital organs, etc.). The author believes that the circulatory system plays an important role and offers many arguments to show that disorders of the vascular nervous regulatory apparatus are the main underlying cause.

5. *Nervous Disorders from Railway Disaster.*—A collision between two railway trains caused several fatalities and resulted, among the survivors, in the development of a large number of cases of nervous disorders. Most of the conditions were of a psychic nature, but of widely different character. The majority resembled hysteria or neurasthenia, but were not typical of either. The objective symptoms were increased reflexes, vasomotor excitability (dermographia, etc.), muscular tremors, hypersensitiveness of the hysterogenetic zones, hypalgesia or hyperalgesia. Hysterical convulsions did not occur. Among the neurasthenic symptoms the most prominent was fatiguability. The patients were also irritable, easily upset and thrown into a panic. In two cases memory weakness developed. Hypochondriacal delusions occurred. Treatment consisted of rest in bed, suggestion and overfeeding. Electricity was used in some cases and sedatives were occasionally employed.

6. *Affect Variations.*—A further discussion of amentias and hallucinatory paranoias. The protracted affect disorders and ecnoic states appear, after all, to be true emotional psychoses since their cause lies in the affects or emotions. Their entire dependence upon the underlying emotional state distinguishes them from other psychoses and psychopathic states.

7. *Luetic and Tuberculous Affections.*—A man of 47 and his wife, a woman of 36, suffered from symptoms apparently of a syphilitic meningomyelitis involving the cord chiefly. The man died after a six-year course of the disease during which there were indications of Pott's disease of the vertebræ and compression myelitis. The woman still lives. The differential diagnosis between luetic and tuberculous meningo-medullary disease is discussed at length, but one is left with the impression that their certain differentiation is still to be regarded as difficult or impossible.

(Vol. 32, No. 1. July, 1912)

1. Metabolism Studies in Patients with Epileptic and Epileptiform Convulsions. W. Tintemann.
2. Neurorecidives of the Luetic Affections of the Nervous System. A. Romagna-Manoia.
3. Incidental Effects of Sedatives. A. Gregor.
4. An Amplification of the Wassermann Method. Tests with Quantitative Variation in Fluid and Complement. O. Klieneberger.
5. Neurasthenia and Tuberculosis. An Attempt to Differentiate from the Modern Conception of Neurasthenia a Form with Organic Origin. N. Rudnitzky.

1. *Metabolism Studies.*—A series of metabolism tests of urine and feces in six epileptics showed wide variations in results, there being many circumstances, anticipated and unforeseen, which came into play. Nevertheless, certain facts seemed to be demonstrated, some of which are merely confirmatory of the experiments of others. A diet uniformly poor in salts and rich in proteids is badly borne by epileptics and usually leads to increased frequency of convulsions and confused states. At the time of a seizure or especially a series of seizures, a number of disturbances in metabolism occur which are connected with the convulsion and, to a certain extent, characteristic of it. The most frequent of these is an increase in the total acidity of the urine which is apt to precede the attack a short time and be followed by a decided falling off in the acidity after it. The principal increase is in phosphoric and uric acid between which there seems to be a considerable parallelism. No rules regarding nitrogen elimination are possible on account of extreme variations. The quantity of urine is sometimes increased following an attack; during a series of attacks it is often diminished. Two cases with convulsions but not of idiopathic epilepsy showed metabolic disorders which could not be said to differ from those of true epilepsy.

2. *Neurorecidives.*—Brief summaries of eighty cases are given. The number of recidives or recurrences of nervous symptoms in syphilis is greater in men and occurs chiefly in those who have acquired their syphilis between 15 and 30 years of age. That most of the cases should fall in this period and that the majority should be men coincides with syphilis in general and should not be given the importance which the author attributes to it. The recidives usually occur rather shortly after the appearance of the first nervous symptoms. One can probably assure a thoroughly treated patient in whom three years have elapsed without a recurrence, that he will not have another. Alcohol and lack of sufficient treatment seem to be the chief predisposing causes. The gummatous-meningitic forms seem most liable to recidives, next the mixed forms and last the peripheral neuritic. The facility and certainty with which the author diagnoses these various forms of syphilis of the nervous system on purely clinical symptoms is enlightening.

3. *Sedatives.*—In all the nine cases tested, veronal produced a lessening in blood-pressure. A similar effect followed the continued use of proponal, neuronal, isopral and adalin in the majority of the cases. Paraldehyde and choral hydrate reduced blood-pressure in only one half of the cases in which they were used and trional in only one out of four. The rapidity with which the alteration in blood-pressure occurred and its duration seemed to depend entirely on individual peculiarity and not on the drug. The supposed entire harmlessness of these agents is not supported in the experiments. Detrimental effect on the heart action in the shape of arhythmia was often observed.

4. *Wassermann Reaction.*—Besides performing the Wassermann test with increasing or decreasing doses of the serum or spinal fluid to be tested, the author estimated the titer by employing decreasing doses of complement. In this way positive spinal fluids are frequently detected which are negative with the full dose of complement. What advantage this procedure can have over the the titration by varying doses of the fluid itself, the author does not state.

5. *Neurasthenia and Tuberculosis.*—Out of 242 neurasthenics, 173 or almost 70 per cent. were tuberculous. This group bears certain characteristics which differentiate it from the much smaller group of true neuras-

sthenia and warrant its separate classification. Influenza figures almost constantly in the etiology, the heredity is nearly always tuberculous, the number of women is almost double that of men as against an almost equal division of the sexes in neurasthenia proper. The duration of the disease in more than half the cases was only a few months. The psychic symptoms played a relatively slight rôle. Objectively was the almost constant existence of consolidation of the right apex and the very frequent occurrence of a latent pleurisy. The course and prognosis were relatively favorable, the treatment preferably directed toward general improvement of strength and nutrition. Guaiacol carbonate and cresote were the best therapeutic measures.

J. W. Moore (Central Islip).

MISCELLANY

Aphasia and Agraphia. E. Martin and C. K. Mills. (J. A. M. A., Oct. 26, 1912.)

Two cases of motor aphasia and agraphia, illustrating the types that are suitable for surgical or specific treatment, are reported by the authors. They also discuss the questions of localization of brain lesions both in these conditions and other varieties of aphasic disturbance. The article is lengthy and quite fully illustrated. They say that it is no longer sufficient to give the surgeon indefinite directions. He should find the lesion located by his neurologic confrère occupying the central portion of the area exposed. Aphasia and agraphia are not infrequently the focal symptoms dominating the clinical picture in which operation is under discussion, and the symptoms differ so much in character and degree and in their symptomatic associations that it is possible to designate at least four or five areas for election for osteoplastic operations, and four of these are considered in the paper. The symptoms which are most characteristic as indicating each of these are detailed as well as the methods of bounding the areas on the external surface of the cranium. It is important both to the neurologist and to the surgeon to consider whether or not the focal disease of the brain is syphilitic and amenable to constitutional rather than to surgical measures. In one of the cases reported the presence of positive Wassermann and Noguchi reactions, together with the other symptoms, decided the question against operation, while the other was diagnosed in the absence of such a positive result as non-specific, and in both cases the diagnosis was correct, as shown by the final result. Together with general remarks on craniometric measurements, the limits of the osteoplastic operation for lesions in Wernicke's zone and for lesions in the angulo-occipital region are also given in detail, as well as of those causing motor aphasia. For these details the reader is referred to the article itself. In certain aphasic and agraphic cases in which the lesion is deep seated, operation is clearly contra-indicated. The characteristic symptoms in such cases are, briefly stated, the completeness of the accompanying hemiplegia together with such phenomena as indicate evident involvement of the capsules, internal and external, the claustrum and the basal ganglia.

Muscle-Group Isolation. J. H. Pollock and E. B. Jewell. (J. A. M. A., Nov. 9, 1912.)

These authors discuss the value of the method of "muscle-group isolation" introduced by Schwab and Allison for putting out of action the muscles at fault in spastic and athetotic conditions. The isolation is accomplished by the injection of 80 per cent. alcohol into the nerves supplying the muscles concerned, causing a paralysis to be later treated by physiologic exercises and educational methods. Their claim is that there is a gradual return of function without a recurrence of the spasm. Pollock and Jewell, however, combat this claim, and publish six cases supporting their contention. They say: "It is extremely doubtful if we can be assured of return of motor function in every case subjected to this treatment, and it is preferable to suffer with athetosis and possess function than to be relieved of the athetosis and have function disappear. There is no certainty that the spasticity will not recur after some time, and from our cases it would seem that the spasticity will probably reappear. In cases in which shortening of the contracted muscles has occurred, the procedure is valueless unless supplemented by other surgical measure, as tenotomy, etc. In our opinion there is but one indication for the procedure in the treatment of spasticities, namely, a cross-legged deformity due to spasticity of the adductor groups of muscles occurring in a child, who on account of the deformity is unable to learn to walk. It may be possible in such instances to educate the child to walk during the time that the deformity remains corrected, and in event of the return of the spasticity, the ability to walk, although hampered by the resulting deformity, may remain. We would particularly warn against the attack by alcohol of any nerve possessing important motor functions, as the ulnar, median, etc."

MULTIPLE SCLEROSIS. L. H. Mettler. (J. A. M. A., November 2, 1912.)

The author remarks that the literature of multiple sclerosis is so full of contradictions that it is unsatisfactory reading. It has been called in Europe one of the most common of the organic nervous diseases, and in America one of the rarest. He introduces his discussion of the subject with histories of three cases, so as to show how quite dissimilar troubles may be classed under this head. One is a typical case with marked neuropathic heredity; the second is less clear, both etiologically and clinically; the third is a pure case of cerebrospinal syphilis with merely a remote resemblance to multiple sclerosis. In reviewing the pathology, he finds that statistics are unreliable as regards the frequency of the disease. The symptoms are not uniformly distinctive and diagnostic errors are far too common. No two investigators seem to agree on the physical basis or patho-physiology. This is the first and most impressive inference one draws from the voluminous literature of the subject. The crux of the whole matter is, of course, the plaque or sclerotic patch. This is fairly distinctive, and if agreement could be reached as to its origin and essential constitution we might have a basis for statistics. He does not think their general distribution is ground enough on which to erect a classification of six types of the disease, as Bramwell has done, and even the more common distinction, as types, between the cerebral and spinal localization is misleading. Differences of opinion also prevail as to their relationship to the blood vessels, and he believes that most modern pathologists do not accept them as limited to this one disease. His own private and hospital records have led him to conclude that multiple sclerosis of the typical Charcot type, with some marked neuropathy in the ancestry, is a very rare disease.

Book Reviews

LECTURES ON CLINICAL PSYCHIATRY. By Dr. Emil Kraepelin. Revised and edited by Thomas Johnstone, M.D. Third English Edition from the Second German Edition. William Wood and Company, New York.

That Kraepelin's Clinical Lectures should reach another edition in English is not to be wondered at considering their intrinsic value. We have had occasion to speak of the previous edition. The present one differs from it in having a short appendix in which new matter bearing on the manic-depressive psychoses and dementia præcox is added—also a discussion of the cyto-serological diagnosis of general paresis. We recommend this volume to all those who would gain an idea of Kraepelin's general views.

DIE VASOMOTORISCH-TROPHISCHEN NEUROSEN. Eine Monographie von Dr. R. Cassirer, Privatdozent an der Universität Berlin. Zweite umgearbeitete und vermehrte Auflage. S. Karger. Berlin. 988 pages. 30 marks.

It is now 12 years since the first edition of this work appeared. Since this time great advances have been made in our knowledge of the sympathetic nervous system. These have found an adequate exposition in the present volume. It is not a revision of the first edition; it is an entirely new work.

Cassirer first develops the present day situation with reference to the anatomy and physiology of the vasomotor and trophic systems of nervous mechanisms. The Acroparesthesiae and related syndromes are then described. Then follow chapters on Erythromelalgia, Raynaud's Disease, Acroasphyxia Chronica, Scleroderma, Acute Circumscribed Edema and Multiple Neurotic Skin Gangrene.

These are complete and well-considered chapters, special stress being given to the allied conditions so frequently met with in a consideration of vasomotor and trophic disturbances.

This monograph will remain a classic for many years as it provides not only a faithful retrospect of what is known in these fields, but also contains much stimulus to research for the solution of many problems still awaiting the neurologist's probing curiosity. JELLIFFE.

BRAIN AND SPINAL CORD. A manual for the study of the Morphology and Fiber-Tracts of the Central Nervous System. By Dr. Med. Emil Villiger, Privatdozent in Neurology and Neuropathology in the University of Basel. Translated by George A. Piersol, M.D., Sc.D., Professor of Anatomy in the University of Pennsylvania. J. B. Lippincott Company, Philadelphia and London.

We have had occasion to review the second edition of Villiger when it appeared and welcome this translation of the third edition. This is unquestionably one of the best short volumes, on the anatomy of the nervous system, published. The serial section reproductions from the actual specimens forms an invaluable feature.

Der Infantilismus, die Asthenie und deren Beziehung zum Nervensystem. Von Prof. Dr. Paul Matthes, Privadozenten für Geburtshülfe und Gynäkologie an der Universität Graz. S. Karger, Berlin.

Infantilism, as a term, dates from the time of Lasègue, who in 1871 described it as the persistence of physical and psychical infantile traits into the adult stage. Tandler spoke of them as morphological anachronisms, while Stiller proposed a term asthenia universalis congenita. The author disapproves of the division of types into the Brissaud and Lasègue-Lorain forms. He proposes to discuss the anatomical variations and utilizes the combined term asthenio infantilism. He then spends 188 pages in discussing the anomalies and their effects upon the organism and upon woman particularly as it affects their procreative functions. To obtain a review of the type the author invites us to look over a group of the experiments of the "Frauenbewegung." The "misunderstood" women of the world offer a further group.

The work offers much to think about even though the generalizations seem at times moderately extreme.

Die grossen Probleme in der Geschichte der Hirnlehre. Dr. Med. Döllken, Professor an der Universität Leipzig. Veit and Comp., Leipzig.

In a short academic dissertation the author gives an entertaining review of the historical development of problems of localization of morphology of topography of the brain and its functions.

Die Ulnaris Lähmung. Dr. Kurt Singer in Berlin. Mit einem Vorwort von Geh. Med. Rat. Prof. Dr. H. Ziehen. S. Karger, Berlin.

In a 130 page monographic study Dr. Singer does ample justice to the subject of the ulnar nerve. Practically everything worth knowing may be found in this thorough dissertation.

Mendel's Principles of Heredity. By W. Bateson, M.A., F.R.S., V.M.H. Cambridge University Press, G. P. Putnam's Sons, New York.

Every student of heredity should have this work. It is a new edition of a previous, 1909, volume, but contains new matter in the form of translations of two of Mendel's original papers with an excellent biographical note.

The student of medicine has heard much of Mendel's laws, but there are but few who have followed their demonstration for human disease problems. Mendel's conceptions have here shown themselves of far-reaching importance and in Bateson's sympathetic review here presented one can orient himself to the present-day attitude towards them.

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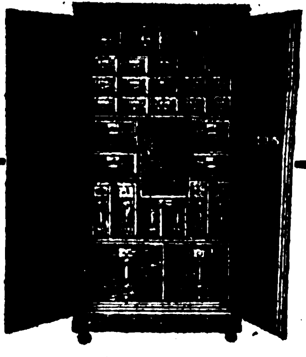

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Original Articles

A CASE OF ALZHEIMER'S DISEASE WITH UNUSUAL NEUROLOGICAL DISTURBANCES[1]

By Albert M. Barrett, M.D.

(From the Laboratory of the State Psychopathic Hospital, University of Michigan, Ann Arbor)

Our knowledge of Alzheimer's disease is still so limited as regards its symptoms, clinical differentiation and the peculiar anatomical process, which has been found in the central nervous system, that further observations should be of interest.

Clinically the case we will report developed at an unusually early age and showed during its course neurological disturbances of a type and degree not yet noted in this disease. For the clinical records we are indebted to the medical officers of the Pontiac State Hospital.

The patient was a woman who was admitted to the Pontiac State Hospital at the age of 35 and died 2 years later, in 1910.

She was a married woman with no known evidences of syphilis, and no history of illness until she was 31, when following an abortion she had a curettage of the uterus. At about 33 she began to show evidences of some nervous and mental disturbance. She would wander about the house and street quite unmindful of her surroundings. As a result of this careless wandering she was often in danger of injury. But little else was known about her until she came into the hospital in September, 1908. She was then in poor nutrition, but there were no serious physical disturbances, except a slight albuminuria.

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[1] Read at the annual meeting of the American Neurological Association, Boston, Mass., June 1, 1912.

She was unable to stand with feet together, even with open eyes. As she sat in a chair her feet were held stiffly together and there was hyperextension of the toes of the right foot. She walked clumsily and found it difficult to maintain an upright position. There was constant coarse tremor of both legs even while lying quietly in bed. This tremor was frequently interrupted by jerking of the legs and arms, particularly of the right side and less frequently of the head. Often single muscles or parts of muscles gave coarse twitching movements. This was particularly marked in the triceps muscles. The legs were held rigidly together and could only be separated by a considerable effort.

The speech was indistinct, slow and stammering and at times explosive. As she talked there was marked tremor of the facial muscles. The ocular movements were not impaired. The pupillary reflexes were present. The elbow and wrist jerks were increased and the tendon reflexes of the legs much exaggerated. Babinski's reflex was present in the right foot but not in the left. The right arm was in a spastic condition. Hand movements were ataxic and the result of an attempt to write her name was a scrawl in no way resembling writing.

Her mental reaction was that of one greatly demented. Only in rare instances could she comprehend what was said to her. She was able to execute a few commands. She would answer no questions concerning herself. Her moods changed rapidly; at times she would laugh in a simple way, and again cry out loudly without any apparent cause. She could not be kept in bed but wandered aimlessly about her room.

About one month after her admission she had an attack in which she fell unconscious and there were convulsive movements. After this the right side was considerably less useful than the left. As she stood with support she leaned to the right and as she sat in a chair she had to be strapped to the back or she would fall out to the right. A few weeks later another convulsion occurred; she grew more unable to control any of her movements; she was totally unable to comprehend what was said to her and she never talked.

In November, 1908, a lumbar puncture showed no pathological findings in the cerebro-spinal fluid. Several convulsions occurred during December. In June, 1909, she was continuously in bed. Her arms were rigid and flexed at the elbows. Any attempt towards active movements of the arms or legs showed great ataxia. If she were supported she tried to walk, but the legs were held stiffly, she stepped on her toes and often she stumbled from the interference of her feet.

In May, 1910, she was entirely helpless; she was continuously in bed and great care was necessary in feeding her to avoid choking. The muscles of the arms, legs and head were rigid. The pupils were not abnormal. She swallowed slowly and with difficulty. She could not talk, but uttered strident unintelligible sounds. The knee jerks were exaggerated; the Achilles jerks were present; Babinski's reflex was obtained in both feet; there was no control of the bowel and bladder. Lumbar puncture showed 2 cells per cm. and an albumen content of about 0.02 per cent.

In August, 1910, she could not protrude the tongue which was thin but not wrinkled. Often she cried out in high pitched tones. The pharyngeal reflex could not be obtained. As she lay in bed her head was pushed back strongly against the pillow and the hair was worn off from its back. The pupils were not abnormal. The arms were contracted, the right more than the left. The muscles showed extreme wasting. The tendon reflexes were exaggerated. The legs were spastic, both flexor and extensor muscles being stretched tensely. The left foot was crossed over the right; the small toes were held in a claw-like position, the great toe being even more extended than the others. The muscles of the legs showed most extreme atrophy. It was possible to entirely enclose the thigh, at its usually thickest part, in the grasp of one hand. The patellar and Achilles jerks were present; no Babinski was now obtained; when the sole of the foot was stroked the great toes were flexed and the small toes extended. She reacted as if in pain when the skin of the legs or arms was pinched; other than this no sensory tests were possible. Several examinations of the fundus oculi showed no pathology. She progressively became weaker. Decubitus developed upon the back and shoulders and death occurred October 31, 1910.

Autopsy Findings.—The autopsy was performed 2 hours after death and showed no acute pathological conditions of the body organs. The lungs were moderately edematous. The heart was small, weighing 130 grams. The kidneys showed a moderate degree of chronic diffuse nephritis.

In removing the brain there was found to be a marked increase of the cerebro-spinal fluid. The brain together with the dura mater covering its convexity weighed 880 grams.

The material available for study consisted of the brain and spinal cord, which had been preserved in 10 per cent. formaline, and portions from several regions of the cortex, fixed in alcohol.

After several weeks' fixation in formaline, the brain was examined. The smallness of its size was very striking. Portions of the dura mater which were still attached to the brain showed nothing important. The pia mater was thickened and opaque over the frontal and parietal regions, but comparatively clear over the base and occipital regions. The larger pial veins were moderately full of blood. The consistency of the brain substance was firmer than usual even when similarly preserved. The convolutions of the entire brain showed extreme atrophy with flaring summits and much widened sulci. In places the otherwise smooth surface of the convolution was finely pitted.

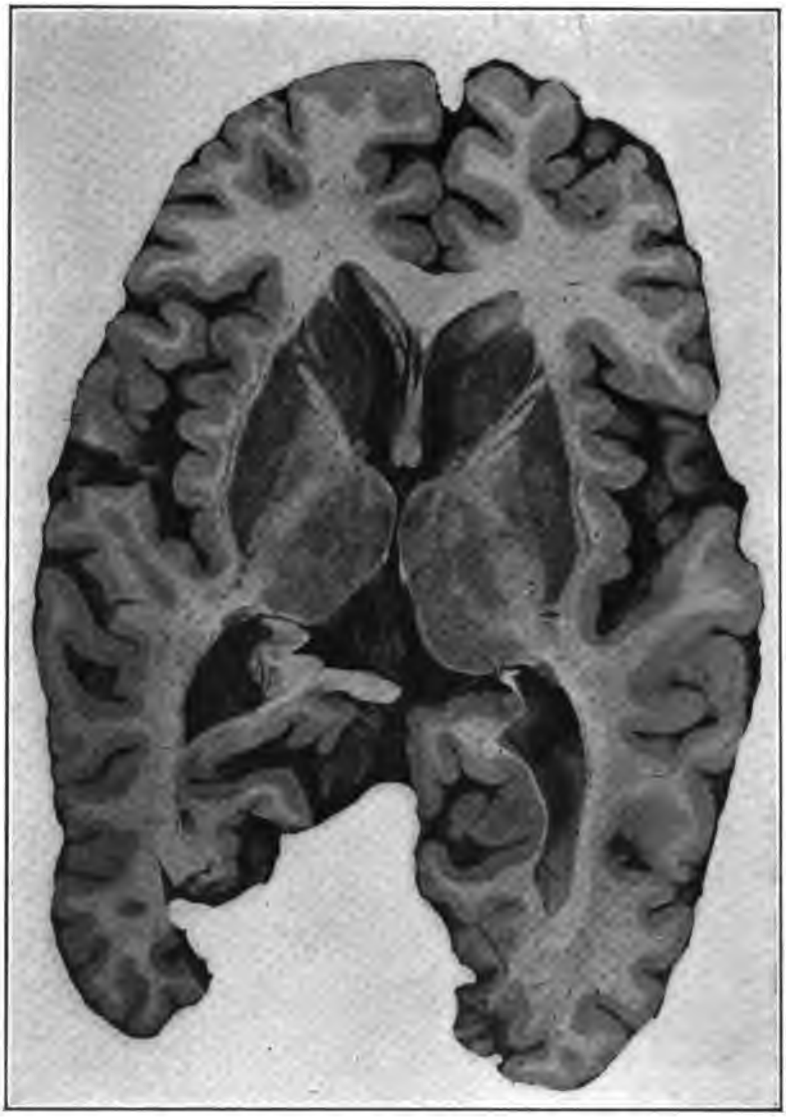

FIG. 1. Longitudinal section through hemispheres showing the extreme atrophy.

The cranial nerves so far as they were preserved were not peculiar.

The cerebellum was small and atrophic in appearance. The left lobe was smaller than the right. The basal vessels were free from sclerosis.

Longitudinal sections through the middle of the thalami showed extreme atrophy of both white and gray substance in all regions (Fig. 1). There was considerable injection of the fine cortical vessels. The lateral ventricles were widened. There were no coarse focal lesions.

The histological examination included the study of preparations from all regions of the cortex, from the cerebellum, basal ganglia, peduncles, pons, medulla and cord. A variety of methods were used including the methods for the demonstration of "Abbauvorgänge" as given by Alzheimer (1).

All regions of the cortex showed numerous plaques and the peculiar neuro-fibril alterations described by Alzheimer and others as characteristic for this disease.

The plaques in numbers exceeded those in any case we have yet studied (Fig. 2). A rough estimate of their number was obtained by the method used by Simchowicz (2), in which is taken the maximum number of plaques which can be found in the field of a Leitz Obj. No. 3 and Ocular No. 3. There thus were found in one field of the right superior parietal convolution 104 plaques. In the right anterior central 63, and in the right occipital 75. The greatest number which Simchowicz found in any senile brain were: frontal region 80, cornu ammonis 28, central cortex 22.

In their distribution through the cortex they were most numerous in the upper strata; and were numerous in the first layer of the cortex. They were found in both optic thalami, corpora striata, and were abundant in the region of the claustrum. They were present in the cerebellum, although in few numbers. In one section there were seven large plaques in one field of the 1/12 objective. In size the plaques varied between 28 μ and 100 μ. The largest were found in the cornu ammonis.

The appearance of the plaque depends upon the method of preparation, but in the sections it was possible to find all of the characteristic details which have been described in the various contributions to this subject. As in other cases we have studied, it seems as if the earliest stages of the plaque formation showed as a focal necrosis of the tissue with loosely arranged products scattered through the area. In Herxheimer's preparations these early stages showed numerous brilliant red stained fatty particles. As the area ages the products become included in phagocytes which cluster around the area. Certain products remain in the area, and these form into a homogeneous mass which persists as the core of the plaque and becomes excapsulated through progressive reactions in the surrounding glia.

In general it seemed as if the forms with the compact homogeneous centers were more numerous than the looser organized areas.

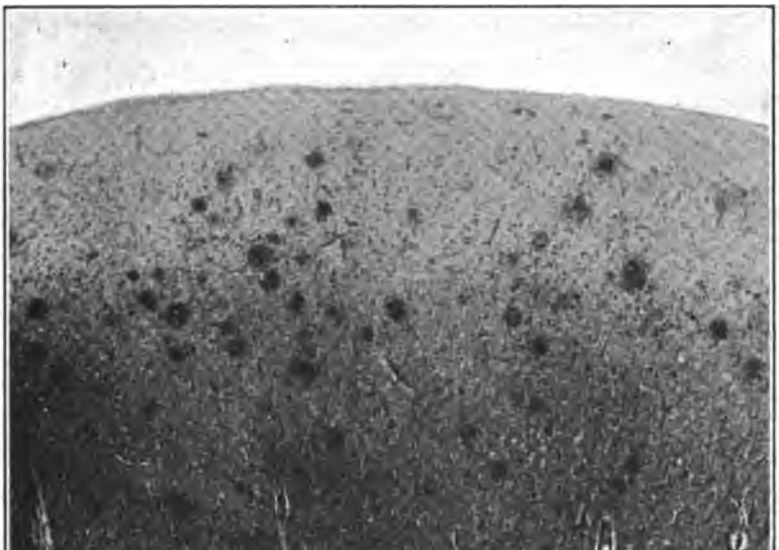

FIG. 2. Plaques in frontal cortex. Bielschowsky stain.

As to the primary cause of the plaques, our studies can add nothing to this obscure part of the subject.

In all sections stained by Bielschowsky's method there were nerve cells showing the peculiar thickened and looped tangles of intracellular fibrils. These showed all of the characteristic forms which have commonly been found in this disease and senile dementia. Many cells were in various stages of disintegration. In the area of the plaques there were found the clubbed and flask-shaped fibrils which were described by Fischer (3).

In Nissl preparations there was evident in all regions a considerable loss in the number of nerve cells. This loss occurred in a patch-like distribution and where cells were gone, it was usually possible to demonstrate the peculiar homogeneous substances with surrounding types of pathological cells, which by other methods appear as plaque areas. The nerve cells showed many pathological forms, many were severely changed and in a process which leads to complete destruction of the cell. In general the cells of the deeper layers were less altered. Of the various types of alteration two occurred with greatest frequency. In one type the cells were shrunken, with wavy processes and darkly stained Nissl granules and nucleus. A type of alteration resembling chronic shrinkage.

In the other type the cells were pale and swollen. The processes were faintly stained. The nucleus was pale and irregular in outline. This type of alteration seemed to lead to a fragmentation of the cell body and nucleus. Both of these types of cell change were observed by Simchowicz in his senile cases. There were numerous cells well advanced towards disintegration, the earlier stages of which could not be determined.

In Herxheimer preparations many nerve cells contained excessive amounts of fatty pigments. This was especially notable in the cells of the cornu ammonis.

Among the cellular elements of non-nervous appearance were many peculiar forms. Many of these were glia cells in various stages of progression and regression. Some were phagocytic for products of the degeneration process. Excessive amounts of fatty pigments were observed in many glia cells, even away from the neighborhood of a plaque. Rod cells were common near the plaques. There were no sclerotic changes in the vessels; some had large accumulations of fat pigments in their walls but there was no infiltration.

In the cerebellum plaques were present in the molecular layer among the granule cells, in the layer of Purkinje cells and in the white substance. The glia of the white substance was increased in amount, large spider cells were common and along the blood vessels there was a dense massing of glia fibers. In one area of the cerebellum there was rarefaction or atrophy of the nervous elements of the molecular layer, and the Purkinje cells adjacent to this were shrunken and stained differently than elsewhere. The largest number of plaques which were found in the cerebellum occurred near this area. Quite generally the Purkinje cells showed excessive amounts of fatty substances. These were

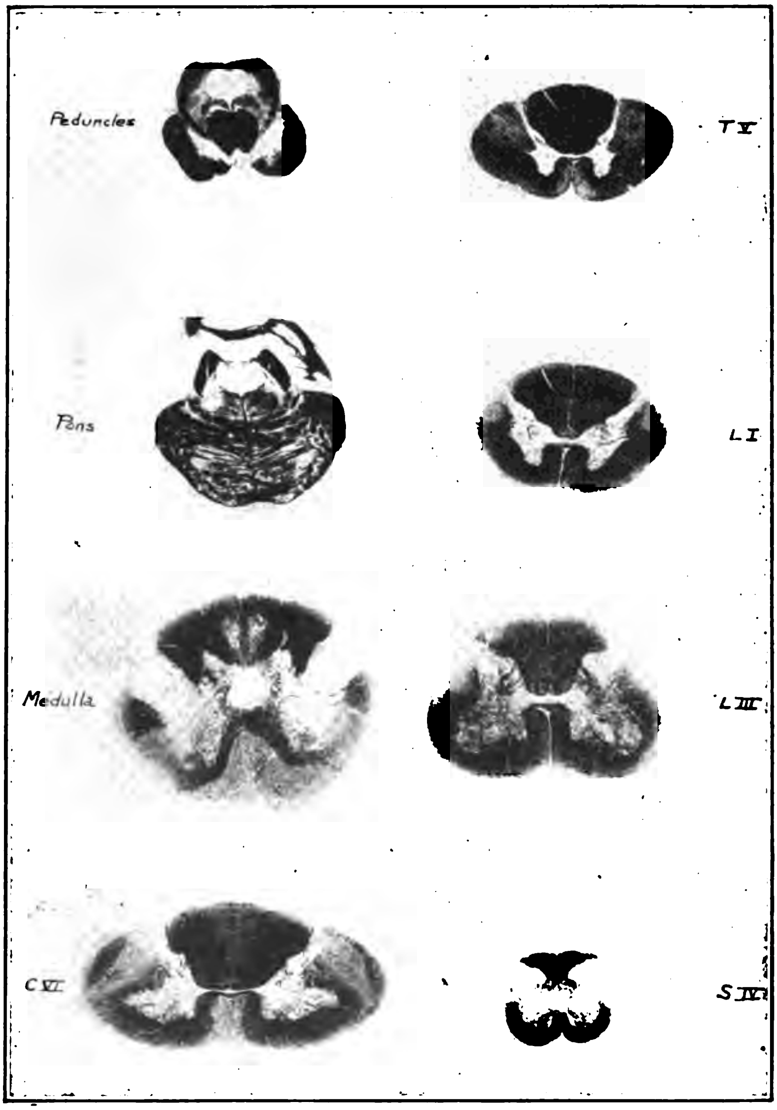

FIG. 3. Showing the degenerations of the descending cortico-spinal tracts in various levels of their course. Pal-Weigert stain.

The cord showed pronounced degeneration in both ventral and lateral columns and a slight paleness of Goll's column. The areas of degeneration were most striking in sections through the cervical region. In a section through *C* VI (Fig. 4) the degeneration was present in a broad strip bordering the ventral fissure, somewhat wider on one side than on the other.

In the lateral column the degeneration included the area of the crossed pyramidal fibers and in addition it extended ventrally through the lateral column becoming more narrow and opposite the lateral tip of the ventral horn, curved toward the margin of the cord and faded away in a paleness which bordered the ventrolateral margin of the cord. This ventral extension took in the area occupied by Monakow's bundle and in addition involved other fibers the nature of which is not certain. The dorsal columns showed slight paleness of Goll's column.

The mid-thoracic sections showed prominent ventral column degeneration and in the lateral columns the degeneration was confined to the pyramidal tract.

The lower thoracic sections showed well-marked degeneration of the lateral columns and a strip of paleness extended along the ventral and lateral margins. The importance of this marginal degeneration and a slight paleness of Goll's column are less certain. In sections from *L* I, *L* III and *S* IV the degeneration was almost entirely limited to the lateral columns.

The degeneration in the ventral and lateral regions was still active and all through the area there were scattered epithelioid cells with inclusions of fatty substances. There were no demonstrable changes of the gray matter of medulla or cord. In the medulla the nucleus of the twelfth nerve contained an abundance of well stained fibers and the nerve cells showed no certain pathological changes.

In sections from a number of regions there were intraspinal parts of the ventral roots. These were in all instances well stained and showed no diminution in their number of fibers. Throughout the cord, the number of cells present in the ventral horns was within normal limits and the cells showed well preserved Nissl granules and no alteration of form. The only change that was demonstrable was a rather large amount of pigment in the cells.

The anatomical findings which we have here given in detail. offer an interesting explanation of the clinical symptoms which were present during the course of the disease. At no time during life was the diagnosis satisfactorily clear.

The combination of the mental disturbances with the striking neurological symptoms suggested general paralysis. Against this was the unusual character of the neurological disturbances, the lack of pupillary involvement and the negative findings in the cerebro-spinal fluid. As the paralysis and spasticity progressed and the bulbar disturbance and atrophy became prominent, the clinical picture resembled amyotrophic lateral sclerosis with unusual prominence of the cerebral involvement and this diagnosis was generally held until death.

In the study of this case two particularly interesting features are present. These are the early age at which the disease occurred, and the unusual and dominating character of the neurological disturbances. Alzheimer's disease has always been described as a disease of the presenile period. The condition takes its name from Alzheimer (4) who in 1906 reported upon certain peculiar changes in the cortex of a case of mental disorder occurring in the presenile period.

In the years following his report, plaques similar to those he described and frequently the neurofibril alterations were observed in the brains of seniles, and a number of contributions appeared dealing with the relation of these changes to senile dementia. From all that has thus far been ascertained it seems that this peculiar process, at least the occurrence of the plaques, in the central nervous system bears an important relation to the pathology of senile dementia, and there is much to justify the conclusions of Simchowicz that "the cases in which these are entirely absent belong to some other form of disease."

Among the considerable number of reports upon cases in which plaques and neurofibril changes occurred, there are some which have been observed in adult years, but mostly in a period usually designated as presenile, and clinically and anatomically have corresponded to the type described by Alzheimer.

Spielmeyer (5) in his recent review of the senile diseases of the central nervous system differentiates Alzheimer's disease to include those cases which vary from the usual type of senile dementia, in that they occur before the true senium and develop a severe dementia accompanied by focal symptoms of aphasic and asymbolic type.

The ages of onset of all of the cases which have been reported as cases of Alzheimer's disease have been Alzheimer (1) 51, Perusini (6) 40, 60, 63, Barrett (7) 50, Bielschowsky (8) 58, Alzheimer (9) 54, Schnitzler (10) 31, Sarteschi (11) 64, Lafora (12) 57, Janssens (13) 55, Fuller (14) 54. All of these have shown much that is common in the clinical symptomatology and excepting the case recently reported by Schnitzler (10) a common histopathological process. In Schnitzler's case, which occurred at the age of 31, there were no plaques but the neurofibril alterations were characteristic.

The circumstance that there seems to be no difference in the character of the plaques and neurofibril alterations between these presenile and the truly senile cases, excepting in the intensity of the process, and that there also occur in each similar changes in the neuroglia of the marginal layer, and the accumulation of lipoid substances in the nerve cells, glia cells, and blood vessels has led to the explanation, that these early cases are prematurely senile and that senility is not essentially a matter of years but of tissue aging. It has become difficult to limit disease processes by age periods, and Alzheimer comments that "anatomical investigation has taught us that progressive paralysis may occur as late as the 70th year and the pathological process of senility as early as the 40th year."

Whether or not one is justified in extending still further forward the limits of presenility to include the case we have reported as developing at 33 is questionable. This same question is raised by Schnitzler, in regard to his case which occurred at 31. He, however, attempts to get around this difficulty by the circumstance that his case showed an enlarged thyroid and the physical appearance of myxedema, and compares the similarity in appearance of the physical and mental involution which occurs from thyroid disease and senility and suggests that the thyrogenic disturbance furnishes a basis, comparable with that present in senility, for the production of the characteristic histological process.

In the present case, there was no disease of the thyroid gland and the physical appearance in no way suggested this. The outward appearance of the woman was not senile, but rather that which one sees in unusually severe organic diseases of the central nervous system.

At the present time it seems impossible to state more regarding the clinical position of this case, than that it shows as far as age is concerned that Alzheimer's disease is not confined to presenile years.

A characteristic feature of Alzheimer's disease are the focal symptoms. In all cases reported, symptoms referable to localized lesions in the central nervous system have been observed. In most instances there have been convulsions, or aphasic and apraxic disturbances.

In no case was there marked paralysis, but in two instances, the case of Schnitzler (10) and Alzheimer (9), there was lateral column degeneration, and in Perusini's case IV (6), which was complicated with syphilis, there was both posterior and lateral column degeneration.

In no other case has there been such a degree of paralysis and bulbar disturbances and such atrophy as the case here reported.

The clinical resemblances of the symptoms to those of amyotrophic lateral sclerosis are interesting and although the anatomical studies did not show any degeneration of the gray substances of medulla or cord, the peculiar type of the fiber degeneration was that of this disease, namely, in the lateral columns of the cervical region the degeneration extended beyond the limits of the pyramidal tract.

The findings in the brain offer a satisfactory explanation of the cord degeneration and one may look upon these as secondary to the extreme degeneration of the nervous elements of the cortex which involved motor as well as all other cortical areas. The process which caused the degeneration was the characteristic one of Alzheimer's disease.

The muscular atrophy which clinically was so well marked, was probably of cerebral origin. Not infrequently an atrophy, rarely so widely distributed as in this case, has been noted in cerebral lesions; and may, as v. Monakow (15) suggests, be due to extensive loss of sensory and motor impulses to the muscles.

Cortical alterations are not uncommon in amyotrophic lateral sclerosis and in some instances the degeneration of the pyramidal tract has been traced into the motor cortex. But the nature of the process which produced the degeneration has not as yet been described. We find, however, that much the same type of descending fiber degeneration may be produced by Alzheimer's disease.

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THE PRESENILE PSYCHOSES[1]

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In attempting to make a diagnosis of mental disease occurring during the fifth and sixth decade of life one encounters many difficulties. Clinically this is seemingly more difficult in the fifth decade; particularly is this true among women. A psychosis arising at this time of life is assumed to be connected with alterations in the process of growth and internal secretory changes. In the sixth decade one encounters the suspicion of premature old age. The course and progress of certain cases occurring during the involutional period, together with an inability to institute measures for their relief prompts this paper. These patients seem to suffer greatly and attract more observation than most cases seen in our hospital wards.

Kraepelin has done a great service to psychiatry in demonstrating the necessity of grouping certain symptoms so we may be able to describe certain disease entities, showing us that we should no longer be satisfied with a classification into melancholia, mania, dementia, etc., but should look upon the study of psychiatry as observing each individual case as if it were a disease to itself. Kraepelin and Dreyfus have concluded by a statistical method that the involutional depression might be and is classed as a mixed state of manic depressive insanity. By a statistical method this probably is true, as a great many features of the manic depressive psychosis are present during a course of an involutional melancholia. However, recoverability, a feature of the manic depressive, is absent.

During my work among the insane I have been impressed by the dissimilarity of depressed phases together with dissimilar pictures presented by cases occurring during the involutional period of life. A number of depressed cases have shown certain minor features of the symptom complex of involutional melancholia with recovery, while others were progressive. It is not my purpose to offer anything new or original, but more of a revival of an interesting group of cases occurring during the involutional period. The following cases occurring during this period of life have interested me, especially regarding the various types or characteristics they present. I have omitted any reference to the frankly organic cases, occurring in the sixth decade of life, but mean to deal with such cases in which premature old age is suspicious.

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[1] Read in a Symposiun on Mental Diseases at Hotel La Salle, Chicago. April 19, 1912.

Case 1.—White woman aged 61 years. The offspring of an eccentric father, who was easily depressed and inclined to worry over trifles. It is quite evident he was unable to adjust himself properly to the usual routine of life. The mother showed nothing of particular interest. One sister of the patient has had an attack of recoverable psychosis. Little is known regarding patient's early life, except that as a child she was inclined to cry a great deal. She married at twenty-two, giving birth to one child, who has suffered an attack of recoverable psychosis. She was a widow after two years. She again married, giving birth to two children. Her married life has been happy, although she has been proud and ambitious and had a fear of public opinion which ruled her conduct and actions.

Ten months previous to her admission to the hospital she attempted to starve herself, thinking she could not eat, and that food did not agree with her. She complained of abdominal discomfort, and talked to herself a great deal, worrying a great deal, and thinking her soul was lost.

When admitted she had lost thirty pounds in weight, since the beginning of her attack. She looked weak and anemic. The hair was dry, slightly gray, and the skin was dry and wrinkled. She complained of a burning sensation when pressure was made over the epigastrium, but no abnormal physical findings were demonstrated. Her bowels were constipated, urine negative, and the pelvic examination was negative. She reached the menopause at the age of 49. Arcus senilis was present with marked arteriosclerosis; blood pressure 180. The neurological examination showed some subjective cutaneous sensations. She stated she had hot flashes, and "every dog-gone thing in the world that anybody ever did have. I feel like I was a lump of lead." The pupillary response to light was not as brisk as one would expect. The superficial reflexes were diminished, while the deep were plus.

The patient was clearly oriented in all three spheres, recognizing those about her. She was clear as to time, evidenced no perplexity, and on the whole seemed clear in her consciousness.

Emotionally she was depressed, worried, wailed and moaned, although she shed no genuine tears. She was, however, easily stimulated to laughter, and when the piano was played she danced about the room, suggesting thereby that her depression was not so extreme as one would expect on first observing her. Associated with this wailing and depression was some agitation, and wringing of the hands. She walked the floor a great deal, wringing her hands, and seemed to be quite distressed. Associated with these depressive ideas was an idea that her mind was very bad, and that she had been "worrying, worrying, worrying, and got nervous prostration." Her memory sphere presented no abnormalities.

During her first month's residence here, active wringing of the hands, walking the floor, and talking to herself were quite marked. She was so agitated that she picked the skin from her face, saying she was lost forever, repeating it many times, thereby suggesting some poverty of ideas. She continued to be stimulated to react to her surroundings, and showed considerable distractibility. She developed a number of ideas of reference, thought the nurses and physician were persecuting her, keeping her relatives away, and that her husband had divorced her. Three months after admission her agitation became more marked. She walked the floor continually, was very excited, and claimed that she was lost. She said she was dead, that her breath was gone and she was unable to breathe, and her lungs were gone, that her stomach had left her and she could not eat, although she ate ravenously at each meal. She believed that her body was the Devil, and she was really someone else, thereby suggesting considerable nihilistic tendencies. She had ideas of reference, thinking the patients abused her. She thought her children and husband were dead, and that she was unworthy, suggesting some self-depreciation. Her activity continued until about a year after admission, after which time she was not agitated, but would moan and cry, accusing herself, saying she was dead, and that her body was no longer her own. Throughout the recital of her moaning and crying she might have been eating a piece of candy or an apple, suggesting that she did not suffer as intensely as one would think, upon first observing her. Throughout the course of her excitement she slept well. She was inclined to excuse her present condition on the grounds of punishment for occurrences during her past life. A little over two years after the onset of her psychosis she lapsed into a more or less chronic state, in which she showed a predominance of nihilistic ideas, with a slight agitation, indifference of personal appearance, and extreme untidiness and filthiness. She has been very irritable, occasionally attacking persons rather impulsively.

Case 2.—White female 61 years of age. Family history is meager. Two brothers drank to excess, and one sister died at fifty years of age, as the result of a "stroke." Her mentality was not up to par.

As a child the patient was quick to learn, and was much as other children. She married at twenty years of age, giving birth to four children. At the age of thirty-six she left her husband on account of drunkenness, and has since followed the occupation of a seamstress. She was always ambitious not to be a burden in her old days, and worked very hard to avoid this. It had become almost an abnormal fear with her. When she was fifty-eight years of age she began to think men were following her about. Six months later she thought her son's wife was attempting to poison her in order to secure her small piece of property. She afterwards thought that the people living in her house were employed by her daughter-in-law's relatives to poison her. This condition continued until six or eight months previous to admission when she began carrying food about in a hand bag, refusing to eat in the house. She went to her sister's and her persecutors followed her there, and attempted to poison her. She feared to stay alone. She believed that she carried a large life insurance, which was not true, and they were selecting a lone and defenseless woman like herself so that by her persecution they might obtain the insurance. They pumped gas into her room in order to stupify her. She presented a definite system of delusions of persecution. She became extremely restless, fearful, and agitated, and owing to her intense fear and suicidal tendencies she was committed to this hospital.

Since the beginning of her psychosis she has been depressed, talks much of herself, and of her terrible fate. Throughout her life she has been inclined to look upon the dark side and has always been more or less suspicious.

When admitted she was under weight. Her nutrition was poor. Hair was gray and dry. The mucous membranes were pale, and the thyroid gland was easily palpated. There was little if any sclerosis of the peripheral arteries. Arcus senilis was present, and blood pressure was 110. She began menstruating at the age of sixteen, and ceased at the age of forty-five. She had one abortion at twenty-eight. She was hypersensitive over the radial surfaces of the forearms, and the outer surface of the legs, with some increased tenderness of deep nerve trunks to pressure. The pupillary response to light was not as brisk as one would expect. The superficial reflexes were diminished, while the deep were apparently normal.

She was well oriented in all three spheres and apparently presented no clouding at the time of admission. She did, however, show considerable depression and anxiety, associated with wringing of the hands, and the expression that her life had turned into an awful hell. She thought that someone was trying to hurt her. She presented a system of delusions of persecution to which she reacted by fear of impending danger. There were no hallucinations and no nihilistic ideas. She became very resistive and after first month refused food, losing considerably in weight. After a residence of three months she believed that she was paralyzed, that she could not swallow, that her stomach was gone, and she could not eat, that her breath and lungs were gone, and she gave short panting respirations and occasionally spoke in a whisper to prove this. When her food was brought to her, even though she thought she could not swallow and that her stomach was gone, she would eat heartily. A month later her depression was extreme. She seemed to present some clouding, would scream, was very destructive and resistive, profane and obscene, untidy and filthy. On the whole she was extremely agitated, and frequently asked to be killed. After six months' residence she continued to be very miserable, and after a year there was little change. After a residence of two years she lapsed into a more or less quiet state with occasional outbursts of excitement, in which she was quite abusive and still showed some marks of the old system of delusions, with anxiety. She continued to have some fear but there was a tendency to repeat the same phrase many times, "Oh, you won't hurt me, Oh, you won't hurt me," until the same was lost in a whisper.

Her physical health improved to some degree and she became more quiet. After two years she was easily stimulated by little occurrences in the ward, when she began to repeat the phrase, "Oh, you won't hurt me."

She now, after a residence of three years, lapses into a chronic state, evidencing some degree of fear although little anxiety. She sits about in a rather apathetic manner, but can still be stimulated to present some apprehension. She usually asks if harm will come to her.

Case 3.—A white woman 54 years of age. History is very meager. She is thought to have been much as other girls. Nothing of particular interest is obtained regarding her history, except that six months prior to admission she was depressed and attempted to take her life.

At the time of her admission she appeared to have lost some in weight. The mucous membranes were pale. Dermographia was marked. Heart was slightly enlarged with a rapid pulse. Sclerosis of the arteries was well marked. Blood pressure was 155. Arcus senilis was present. She reached the menopause at the age of forty-nine years. The neurological examination showed some numbness of the arms, and the sensation of pins and needles. The pupillary responses were not as brisk as one would expect, and there was a coarse tremor of the hands, fingers, and tongue. The corneal reflexes were absent. The remaining superficial were diminished, while the ankle and knee jerks showed some slight inequality, being more active on the left side. Otherwise the physical examination presented no abnormalities.

She was well oriented in all three spheres; recognized those about her, and apparently presented no clouding. She was very depressed, and anxious, presenting considerable agitation. She also presented a slight tendency towards self-depreciation, and some ideas of unworthiness. She gave a history of a slight hallucinatory experience, resembling those of a delirious state, but these have not since been observed. Her memory sphere showed no defect. Shortly after coming to the hospital she ran a very rapid course, became more depressed and extremely agitated, grew quite weak, lost in weight, and her anxiety and agitation were very marked. After a residence of one and a half years her condition subsided into an apathetic state, with disinterest in her surroundings.

After a residence of two years the apathy is still present. She does not recognize persons previously met whom she should know, and receives the visits of her husband with little show of affection. When things are done which concern her, for example a reëxamination, she again shows a slight anxious affect. After a residence of three years her condition is one of apathy, but she still presents a slight anxiety when stimulated. She does not appear depressed.

Case 4.—White woman 63 years of age. Has always shown a disposition to worry, and to be easily excited. She has one sister who has had three or four attacks of manic depressive excitement. Six months previous to admission the patient was unable to sleep, refused to eat, worried a great deal, and thought her husband was persecuting her.

At the time of admission her nutrition was impaired. Mucous membranes were pale, and there was some slight edema of the lower eyelids. The hair was iron gray, and thin. She complained of some dizziness upon arising, with some pain in the region of the heart, and a sensation of being tired. She also complained of "heavy breathing" with palpitation of the heart. The physical examination showed some emphysema with considerable hardness or sclerosis of the arteries, with an accentuated second aortic sound. The pulse 80, the blood pressure 180. Her appetite was poor. The urine showed a specific gravity of 1,026, with considerable hyaline, epithelial and granular casts. The neurological examination showed a slight defect in the sense of smell, with slight arcus senilis. There was some sensation of cold, and a feeling of pins and needles pricking her. Otherwise the physical examination presented no gross abnormalities.

She was well oriented in all three spheres. She recognized those about her, and apparently presented no clouding. She stated she was depressed on account of her sister's illness, although this had never produced a like condition before. Emotionally she showed a distinct depression with considerable agitation. Her memory presented no defects. She did, however, state that she had periods when she could not remember very well.

After a residence of two months she improved. Her depression, however, continued, but her agitation was not so marked. She was taken home by her husband. Her mental condition, however, remained as an anxious or agitated depression. After remaining home three months she committed suicide by cutting her throat.

CASE 5.—White woman 61 years of age, whose family history is meager. One aunt was insane. Three years previous to admission she presented many neurasthenic symptoms, and two years later she showed a tendency to wander from place to place. She was anxious and worried, heard voices which persecuted her, and caused her to travel from one place to another.

At the time of her admission her general state of nutrition was good. Hair was gray. Arcus senilis was present. She reached the menopause at 40 years of age. The arteries showed a marked sclerosis. Blood pressure was 175 mm. The neurological examination presented a defect in hearing due to a chronic middle ear disease, and some defect in sight, corrected by glasses. She presented many subjective cutaneous sensations, such as pins and needles sticking her, and cold flashes. Otherwise the examination was negative.

She was well oriented in all three spheres. Apparently presented no clouding. Emotionally she was anxious, heard voices persecuting her, calling her maiden name, to which she reacted, presenting an anxious affect, and an irritable and irascible mood. Her memory sphere showed no abnormalities. She attended well to things about her, and was interested in her surroundings. She was able to take care of herself, and kept herself neat and clean.

After a residence of three months she became more anxious and apprehensive regarding voices. She had ideas of reference, directed toward the patients and nurses, and believed they were in a league to persecute her. She reacted to this very strongly. She made odd and peculiar remarks such as "Gipsy gigoo," "They Chicagoed me," and "Shy shooed," which she would not explain, but they seemed to have a rather pleasant affect associated with them. She smiled easily, and appeared shy when questioned regarding them. After a residence of three years, or six and one half years after the onset of her psychosis she presented little change. She continued to have hallucinations which presented an anxious affect associated with an irritable and irascible attitude.

CASE 6.—White woman 63 years of age. Family history is meager. At the age of 45 it was noticed she talked to herself Thought to have had hallucinations of hearing. About eight years previous to admission she developed persecutory ideas, thought her sister was robbing her and abusing her. She reacted to this by threats of violence, which became more marked, resulting in her commitment to this hospital.

At the time of admission she was below par in physical health. She was weak, pale, and anemic. The hair was dry, complexion sallow, skin being wrinkled, and the bones prominent. She complained of some shortness of breath, and palpitation of the heart. The pulse was rapid, and the arteries were considerably hardened, the heart being somewhat enlarged. Blood pressure was 155. Arcus senilis was present. Hearing was impaired on the right side. Otherwise the physical examination presented nothing of particular interest.

She was well oriented in all three spheres. Recognized those about her, and apparently presented no clouding. Memory sphere presented no abnormalities and grasp on general knowledge was good. She presented no insight. Her retention showed a slight defect, which was probably due to her emotional state. She was extremely irritable, abusive, and resistive, resenting everything that was done for her, and believed that people were persecuting her, and attempting to injure her. She had many ideas of reference. She presented no definite mood of depression, but showed considerable apprehension and anxiety. There are many features which suggest a negativistic trend, as for example she resisted everything that was done for her, and was not unlike some resistiveness observed during the course of a dementia præcox. She denied hallucinations. After four months' residence she presented little change, except she was more abusive and irritable. She resisted her bath, defied every request, resisted going for exercise, and frequently did opposite of what was asked of her. After a residence of one and a half years her condition presented little if any change.

CASE 7.—Woman 63 years of age. Family history is meager. She is thought to have been as other children, and was well until eight years ago, at which time she developed persecutory ideas, and believed she had large sums of money, and was quite wealthy. She would leave her home, remaining away for a number of days, always as she said, "attending to business and money matters." She became very restless at night, thought her father was coming for her in an airship, and she would sit by the window for hours watching for him. At times she would refuse to eat for days. She also heard imaginary voices, and was extremely irritable. She saw hidden meanings in newspaper articles which referred to her, and thought people were attempting to rob her.

At the time of admission she was in fair nutrition. The physical examination presented little of interest. The hair was gray. Arcus senilis was present. Blood pressure was 110. There was apparently no sclerosis.

She was well oriented in all three spheres, and apparently presented no clouding. Her memory sphere showed no defects.

She presented many delusions of persecution, with some grandiose ideas. Thought she had inherited a great deal of money, and that her relatives and folks were trying to take it from her. She presented no depression or elation. She was, however, easily stimulated to laugh, but on the whole presented no definite mood. She was interested in her surroundings, and personal appearance, but presented some slight indifference in reacting to her delusional trend.

After a residence of two and one half years her condition presents little change. She still has some persecutory ideas, and those of a grandiose character are still rather prominent. She assists with the work, is neat, and for the most part agreeable.

Case one showed a marked hereditary tendency. The father was in all probability one of those unstable individuals given to fluctuations, in capacity and efficiency, becoming sufficiently marked to attract attention; the type of personality out of which the development of a manic depressive reaction seems plausible.

The offspring were in all probability dominated by the same tendency in the germ plasm, as one daughter had a recoverable psychosis.

The patient was a proud and ambitious woman, whose fear of public opinion had become more or less an obsession to her, having been unable to fulfill some of her desires and as failing power is realized her disappointment is great. Her life is empty, or the fullness of a well spent life is absent. She becomes depressed, loses her appetite, but attempts to counteract this state by taking opium. Her worrying leads to her commitment. The general arteriosclerosis with many subjective cutaneous sensations is of sufficient interest to attract comment. The agitation and depression are marked, but she has an ability to react to her surroundings, which is directly opposite to her depression, showing a fluctuation of affect, or that the depressed mood is not constant. Her trend of thought at times suggests a poverty of ideas, but occasionally shows a distraction. The grasp on the situation in which she is placed is good, and she is well oriented. In this particular case we have nihilistic ideas which are constant with frequently a feeling of doubt. The chronic state showed apparent but not real suffering, with a predominance of an agitated and depressed appearance which is characteristic of this type.

Case two does not show the hereditary tendencies as does the preceding, but our available data are less full. However, the brothers and sisters were more or less defective in their particular adjustment.

She was no doubt disappointed in her sexual selection, having divorced her husband during a time when he should have been of most assistance and comfort to her. She may have had thoughts relative to a happy home, certainly having denied herself, worked and saved, with a fear of being dependent in her old age. This had become more or less an obsession.

The unfulfillment of a well-spent life begins to show itself by ideas of pursuit by men, which are probably the result of unfulfilled desires. The absence of any signs of peripheral arteriosclerosis is of sufficient interest to attract attention. A system of delusions of persecution is most interesting in this particular case, and is characteristic of this type. The dominant factor of an anxious depression is also characteristic. A clear grasp of the situation in which she is placed with more or less of a chronic course and clearness of consciousness, without defect in memory, is characteristic for her. The self-depreciation and nihilistic ideas appear comparatively late. The chronic state remains in agitated depression, with stereotyped phrases of a monotonous character.

The history of case three is less full than the preceding. The only available data being a depression for six months. The physical state shows a slightly enlarged heart with marked arteriosclerosis. The pupillary responses were not as brisk as one would expect, with an inequality of the deep reflexes, suggesting some organic change. The patient's age is less than the ages in cases one and two, being nearly four years less than in case two at the time of onset. The appearance again shows an anxious or depressed emotional trend, with a fear of impending danger. The interesting feature of this case is the rapid course it ran—a characteristic of this particular type. The agitation is extreme, the depression is great, but without the nihilistic ideas. She becomes more quiet after three and one half years from the onset of her psychosis, and lapses into a quiet, apathetic state with apparent deterioration. It is well to emphasize the suggestion of organic changes in this particular case. It is probable that we are dealing with some arterial brain disease.

Case four again shows the hereditary tendency, one sister having had an attack of recoverable psychosis. The patient has a more or less unstable emotional trend. The physical condition suggests to me the picture of changes incident to a general arteriosclerosis, however, the ordinary clinical picture of arteriosclerotic brain disease is wanting. The depression and agitation are not as marked as other cases presented. When removed from home and given rest her insomnia and anorexia improved. However, her condition again becomes exaggerated when she is returned to her home. It would seem in this particular case that we should get some organic signs or memory defects, but they were absent.

Case five shows some hereditary tendencies, but not in the direct line as did the other cases cited. Her psychosis began at the age of 58 with more or less fatigue symptoms. The wandering from place to place suggests a senile trait. The vivid hallucinations to which she reacted are also interesting. We again have an anxious affect with an irascible state, which differs to some degree from the other cases. The case might be regarded as a paranoic state, but I do not think the delusions are well enough systematized to classify it as such. We do not have the memory defects which are characteristic of senile changes. It would seem that this case is in some manner associated with the involutional period of life. Hallucinatory experiences and persecutory delusions are characteristic.

Case six began at the age of 43. The hereditary tendencies are absent but our data are less full. Since the age of 55 her ideas of persecution have been prominent. The resistiveness of this patient might be accounted for by an anxious affect. This suggests to me a negativistic trend. By some she may be regarded as belonging to the dementia præcox group, as the picture suggests a katatonic state, but she has not been disinterested, but showed an anxious and agitated state. One would expect a far different picture in a dementia præcox of such long standing. The similarity of dementia præcox is characteristic of this particular type. The absence of memory defects precludes a true organic lesion.

Case seven shows a psychosis arising at the age of 55 with irritability, worry and dissatisfaction with domestic difficulties. She believes her father, whom she thinks is now wealthy, will rescue her. The grandiose ideas, with ideas of persecution with a good system are of particular interest, and resemble those of a paranoid dementia. The picture of dementia præcox so late in life rather suggests that it might be classified as a presenile type.

I have omitted any reference to the type reported by Perusini, namely the cases occurring in the fourth decade; characterized by a slow but steadily progressive mental enfeeblement, disturbance of orientation, difficulty in naming objects, intellectual deficit, amounting in some cases to complete mental blindness, and disturbance of the projection system. Cases which show many features common to senile dementia and are aptly described histologically, first by Alzheimer, second by Bonfiglio, and later in detail by Alzheimer, receive the name of "Alzheimer's Disease." This type of mental disorder has not been brought to my attention by any clinical material. It would seem that in a large hospital for the insane one would find at least an example of such a condition. However, the clinical records of five or six years ago are of little if any value compared to our present day effort.

During the course of an organic disease hyperexcitability is more common with the slighter lesions. Under the heading would come hallucinations, press of speech and activity, excitement whether with excited or depressed moods; such as one sees for example during the earlier stages of alcoholic intoxication. We meet with similar conditions which at present are regarded as functional. A similar group may be mentioned, viz., epileptic manifestations, consisting of either frank convulsions or some equivalent. Evidences of gross organic lesions which are most constant and characteristic, however, are those resulting from destruction of tissue. In all of these cases presented no evidence of gross organic lesion could be demonstrated.

Heredity seems to be an important factor in the cases which simulate the mixed state of manic depressive insanity. Not only are the features of the cases similar but the hereditary tendencies are also very similar. The manic depressive reaction when observed in its simplest form does not appear so much as a special disease of pathologic process, as an exaggeration of a condition belonging to our normal experiences. This prototype in normal life is found in the emotional variability and fluctuations in efficiency and capacity which seem to be an intimate part of our makeup although faintly developed. Further investigation of the types of mental makeup out of which an involutional depression may develop, is most important and may throw light on the peculiar combination of symptoms seen in the presenile psychosis.

A psychosis may not be the only change or picture presented during this period of life, as ofttimes an entire personality may be reversed. Thoughts, actions, and adjustments may be grossly altered. In the study of the climacteric one encounters many changed characters; an abstainer becomes a drunkard, a drunkard an abstainer. Interest is lost in one particular subject which had been very dear to this individual, but is substituted for another. In looking over the history of public men we find change in character and accomplishments, beginning late in life. In private life almost everyone can recall some such character. Are these changes not in some way related to this particular type?

The much abused diagnosis of arteriosclerosis needs at least some comment. In the cases recited it has not been a constant condition; it is true that a moderate hardness of the arteries is present during old age, but even in psychosis arising during the seventh decade of life one encounters an absence of any signs of arterial sclerosis. From the clinical data alone one is not justified in arriving at any conclusion as regards the presence of arterial disease of the cerebral vessels, except to say that arteriosclerosis might be considered as associated with changes incident to the involutional period of life. As has been previously stated the pathologist may give us some desirable information.

In conclusion I might say that an agitated state with depression and anxiety may be present; that a system of delusions of persecution may dominate the picture with anxiety; that a rapid and stormy course of agitated depression followed by a quiescent stage may characterize the course; that an anxious and depressed state associated with arterial changes may show itself quite markedly; that hallucinations with an anxious affect may be the dominant feature; that resistiveness and negativistic tendencies may be quite marked in certain cases and that delusions of a grandiose character may be present, each showing itself in a clear and distinct type. From the clinical material presented one is inclined to believe that a variety of pictures may present themselves during the involutional period of life, or at least seem to be closely associated with presenile changes. From the material presented some cases have suggested that there may be some organic change. A more detailed examination, closer observation and post-mortem findings may lead to some very desirable data on psychosis arising during the fifth and sixth decade of life.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

March 4, 1913

The President, Dr. Smith Ely Jelliffe, in the Chair

A CASE OF ACUTE INFECTIVE ENCEPHALITIS, POSSIBLY OF GONOCOCCIC ORIGIN

By Smith Ely Jelliffe, M.D., and John H. Larkin, M.D.

The patient was a Hungarian, 33 years of age, who had apparently enjoyed perfect health up to the time of his present illness. He was admitted to the City Hospital on the 13th of January, 1913, suffering from a urethral discharge. After spending a day or two in the genito-urinary ward, it was observed that he was not quite clear in his mind and he was transferred to the neurological service. At this time he complained of pain in the legs and bladder, and he had so much difficulty in passing his urine that he had to be catheterized. There was a slight discharge from the penis and constant priapism. Because of his mental condition, it was impossible to elicit a satisfactory family history. With the exception of a slight increase in the reflexes of the lower limbs, some spasticity and a doubtful Babinski, the neurological examination proved negative. There was no temperature elevation at this time. Shortly afterwards the eyes were examined and showed beginning choked disk. Gradually, the spasticity of the lower limbs increased, the mental condition became worse, the patient became more apathetic and less and less responsive, the choked disk became more apparent, especially on the right side, and these symptoms, together with the prominence of the spastic phenomena on the left side, led to the determination to make an exploratory opening over the right frontal lobe in the hope of finding a tumor or abscess or other lesion to explain his symptoms. The patient's temperature, which had been normal at the time of his admission, gradually rose to 101, then fell to normal and again rose to 100, where it remained until the day of his death, when it fell to sub-normal.

Upon exposing the brain, nothing abnormal was found on gross examination; exploratory punctures failed to reach any abscess cavity. The patient died, and the autopsy was made by Dr. Larkin, who made the following preliminary report:

The brain, which weighed 1,400 grams, was somewhat flattened on the left side, and was the seat of an acute form of encephalitis, in which the preponderance of the cells were of a large, irregular type, invading the white matter, with marked infiltration of the walls of the blood vessels. The gray matter was not involved. This patient, at the time of his death, had a gonorrheal infection of the posterior urethra, and smears, taken from the brain, showed a peculiar organism, a Gram positive bacillus, which by culture on serum agar gave a light growth corresponding very closely to that obtained from gonococci. On retransplantation, however, the cultures died out, and Dr. Larkin said he was therefore unable to positively assert that the encephalitis was of gonococcic origin, although that was his belief.

TUMOR OF THE SPINAL CORD

By William M. Leszynsky, M.D.

The spinal cord had been removed from a woman 49 years of age. For nine years she had complained of characteristic root pains in the course of the left sciatic and anterior crural nerves, and at the end of the fourth year the right lower extremity became similarly affected. Subsequently, there were paresthesia, attacks of transient loss of power in the extremities, and a band-like feeling at the level of the lower thoracic region. Ultimately, she became completely paraplegic, with bilateral foot-drop, loss of patellar, Achilles and plantar reflexes, and incontinence of urine. Hypalgesia and thermoanesthesia extended upward to several inches above the level of the umbilicus. The tactile sensibility was preserved. The Wassermann reaction was negative. Although several lumbar punctures were made, no cerebrospinal fluid could be obtained.

The diagnosis was made of a tumor involving the cauda equina, with secondary implication of the cord. At the operation, which was done by Dr. Charles A. Elsberg, a large tumor was exposed which filled the entire lower part of the spinal canal and extended to and over the conus. Most of the growth was removed within its capsule. No improvement followed, and death took place from exhaustion three months later. At the autopsy, a tumor mass was found involving the cauda and filling the sacral canal. This was a glioma. There were syringomyelic cavities in the lumbar and thoracic regions, chiefly in the anterior portions of the posterior columns, with borders of pronounced gliosis. Both the ascending and descending tracts showed advanced degeneration.

A DEMONSTRATION OF THE SYPHILITIC ORGANISM IN THE BRAIN IN PARESIS

By J. W. Moore, M.D.

Dr. Moore read a paper on this subject and exhibited a number of micro-photographs showing the presence of the *Treponema pallida* in the brain tissues of a paretic. The inception of this work, the writer said, and the preparation and staining of the specimens, were his own, but the credit of having been the first to see the organism belonged to Noguchi of the Rockefeller Institute, to whom he loaned a duplicate set of slides for the purpose of looking for a possible granular form of the spirochete. The findings were published in the *Journal of Experimental Medicine* for February 1, 1913.

Dr. Moore said that from his autopsy service at the Central Islip State Hospital, he had a fairly large number of paretic brains in his possession. Early in 1912 a systematic search of these brains in groups of twenty and thirty was made for the *Treponema pallidum.* Seventy brains were thus examined, the cases being clinically and anatomically satisfactory as to the diagnosis of paresis. Without entering into the details of the technique of staining, the speaker said the Levaditi silver method was used, with some modifications which might or might not have been important. An unusually favorable degree of staining resulted in many of the specimens. Noguchi was the first to see the organisms, and found them in variable numbers in twelve out of the seventy cases. Immediately after learning of Noguchi's finding, the speaker said he was able to locate the spirochetæ independently and without much difficulty in all of these twelve cases. In about one half of these cases they were very scarce, but in several they were quite numerous and not at all hard to find. The reason why the writer himself had not seen them during prolonged searching was due to a most interesting and significant fact regarding their location. Having in mind the chronic inflammatory changes which one found in paresis, namely, the infiltration of the pia and vessel-sheaths with lymphoid and plasma cells, the writer devoted his attention almost entirely to these localities, particularly as it was here that the organisms had been found in cases of cerebral syphilis, in the narrower sense. In paresis, however, they were apparently absent in the pia and were seldom seen in the immediate neighborhood of the visible vessels. They occurred, instead, deep within the tissue of the cortex. Their motility and penetrating power was known from dark-field observation and from Noguchi's cultural experiments, and it was evidently by this means that they had found their way to the locations where they were encountered. They were almost always in the nerve-cell layers of the cortex; seldom in the marrow and never in the external neuroglia layer, so far as the observations in these few cases went.

Dr. Moore said it was apparent at once how important the knowledge of the existence of the syphilitic organism in paresis was, but he wished to call attention to a few of the more salient points. First, we were afforded a tangible cause for the chronic inflammatory reaction if not for the degenerative changes in paresis, and one which corresponded fairly satisfactorily in location and distribution. It was no longer necessary to offer theories of metabolic disorder, over-production of anti-body, deficiency in lecithin, etc. In the actual presence of the treponema we saw the reason for the serological findings in blood and spinal fluid. The difference between paresis and cerebral syphilis could be conceived to be only one of location and distribution of the organism. When we considered the results of the experiments with vital staining, which showed that fluids introduced into the circulation practically never reached the depths of the brain tissue, or at most only the superficial neuroglia layer, and also that potassium iodide and even antigens and immune bodies did not pass through the meninges, the inefficiency of anti-syphilitic treatment in paresis, whether it be introduced into the circulation or spinal canal, was made clear. The outlook for the future was also rather hopeless, since the organisms lay at a depth at which they apparently could not be reached by ordinary methods.

Dr. Charles B. Dunlap said there was very little to add to the presentation of facts that Dr. Moore had given. After various modifications of the Levaditi silver method Dr. Moore obtained a very clear stain, showing the spirochetæ (*Treponema pallidum*) jet black against a yellow background. The fact that Dr. Moore failed to find the organism in his earlier examinations was not surprising; they were found not in the mesoblastic tissues, where he had been especially looking for them, but free in the cortical tissues, and one might search through many sections from various parts of the brain and find none.

The results of this work by Drs. Moore and Noguchi, the speaker said, were far-reaching, since they proved (if confirmed—and there was scarcely a doubt that they would be confirmed) what had long been suspected, that the *Treponema pallidum* was the essential causative factor of general paralysis; but this clearing up of the etiology in no way lessened the clinical or anatomical value of the work previously done in connection with this subject. General paralysis would still stand as a distinct variety of cerebral disease, distinct in its anatomical features from other forms, distinct as a clinical group, and distinct in its failure to adequately respond to therapeutic agents and methods heretofore effective in the treatment of .ordinary syphilis. While this was so, the demonstration of the *Treponema* rendered the problem of future therapeutic attack much more definite and more hopeful.

A CASE FOR DIAGNOSIS

By William Steinach, M.D.

A man, 69 years old, a native of Germany and a machinist by occupation. He stated that his father, who died at the age of 78 of cardiac disease, had some sort of a tremor. His mother died in childbirth. The patient was the father of eleven children, of whom seven were living, four having died in infancy. One son was a deaf mute, the result of some meningeal trouble following an injury to the head in childhood. Aside from this, there was no history of any nervous or mental disease in the family.

The patient denied lues and had always been temperate in his habits. He had malaria and typhoid fever in childhood. He was well and worked regularly as a machinist in a safe manufactory up to November, 1892. At that time, while bending over, he was struck on the back of the neck by the end of a bar of steel, two inches thick and fourteen feet long, weighing fully 120 pounds. He was knocked unconscious and remained so for fifteen minutes. He was taken to his home, and shortly afterward began to complain of headache, pain in the back of the neck, fatigue on slight exertion and inability to work. About two months later he became depressed and developed suicidal tendencies, when he was sent to Ward's Island, where he remained for six months.

About a year after his injury the patient developed a tremor which became much aggravated on intentional movements. About eleven years ago he developed convulsive attacks which had recurred more or less regularly about three times weekly. He also had daily attacks of transient dizziness. His convulsive attacks were at times accompanied by total loss of consciousness; at other times the loss was only partial. Sometimes he cried out, foamed at the mouth and bit his tongue, and after the more severe attacks he generally fell asleep. There was no aura. During his attacks, as repeatedly observed by Dr. Steinach and others, he alternately stiffened and relaxed. The seizures had rather the character of hysteroid attacks. His memory afterwards was very hazy.

Aside from the intention tremor, the patient shows no organic symptoms. His pupillary and knee reflexes are normal. His abdominal and cremasteric reflexes are present. He has no Romberg.

His eye grounds as reported by Dr. S. M. Ingerman show slight paleness on temporal edge of both discs.

In connection with this case, Dr. Steinach offered the following conclusions: (1) The persistence and severity of the symptoms after the lapse of over twenty years. The man was wholly incapacitated from performing his usual duties (2) The absence of litigation or any question of damages, which was a strong feature of most of the traumatic neuroses. (3) The strong resemblance of the condition to multiple sclerosis. (4) While a tentative diagnosis of traumatic neurosis had been made, there was a question whether some organic changes had not been superadded.

Dr. J. Ramsay Hunt, who had seen this patient some years ago, said he could never find any definite signs of organic disease. While he regarded it as a case of traumatic neurosis or psychosis, it had always seemed to him, from the severity of his injury, that there might have been some organic lesion. In all other respects it resembled a traumatic neurosis.

Dr. Leszynsky, who had had this patient under his observation about fourteen years ago, said he had noticed that his symptoms always seemed to become more aggravated when he was being exhibited.

Dr. L. Pierce Clark thought that in spite of the fact that the tremor became more intense when the patient was under observation, the condition had existed so long that we probably had to deal here with some organic change rather than a purely traumatic neurosis.

Dr. Benjamin Rosenbluth said that in a similar case seen at the City Home six or eight years ago, where the tremor came on after an injury and was diagnosed by successive visiting physicians as a traumatic neurosis, the necropsy disclosed a lesion in the thalamus.

SPINAL DECOMPRESSION FOR MENINGOMYELITIS

By Alfred S. Taylor, M.D., and J. W. Stephenson, M.D.

The patient was a married man, 62 years old, a watchman on the railroad, whose previous history was negative with the exception of an attack of pleurisy and pneumonia seven years ago. His family history was unimportant; there was no history of lues; no cough.

The patient's present illness began in May, 1912, when while at work he was seized with an intense pain in the chest and back, which became very sensitive to the touch. He was taken home, and for several days the pains persisted. He was delirious and was said to have fever. His condition was diagnosed as rheumatism and so treated. Two weeks after the onset of his illness an abscess developed on the right chest; this was incised and its contents evacuated. At this time he also suffered from retention of urine and his testicles became swollen. This, however, soon cleared up.

The pain and fever persisted intermittently, recurring at variable intervals. Early in August the pain "seemed" (patient's statement) to locate in the neck and back of the head and was followed by a heaviness of the legs and consequent difficulty in walking. The legs gradually became stiff, and in place of the pains he began to have "cramps" which would double him up. In the course of time he also noticed that the upper extremities were growing weak and stiff, and all symptoms gradually progressed until about the middle of August, 1912, when the patient became bedridden. He also complained of considerable pain over the region of the bladder, and examination revealed retention, with overflow. There was obstinate constipation.

When the patient was admitted to the Neurological Institute, on November 13, 1912, in the service of Dr. Frederick Peterson, he was unable to walk or stand, having been bedridden for three months, and complained of paroxysmal cramps in the legs. Examination revealed a marked spastic paraplegia, with decided weakness of both upper extremities. He was unable to feed himself, and voluntary movements of lower extremities were impossible. The bladder was distended and there was impaction of the colon. There were no distinct atrophies, though the leg muscles were flabby. There was no tenderness over the vertebræ, but on the right side of the neck, over the lower three cervical vertebræ, there was a distinct infiltration which was tender on pressure and which somewhat limited the movements of the neck. Over the right chest, just underneath the clavicle, there was slight infiltration which was attributed to the old abscess. The knee jerks were plus plus and equal; the ankle jerks were plus and equal; there was a double Babinski and Oppenheim. There was double ankle clonus; the right inexhaustible, the left exhaustible. The abdominal and epigastric reflexes were very sluggish; those of the upper extremities were plus, L. > R. There was a diminution of the thermal, pain and tactile sensations up to the level of the first dorsal. The eyes were negative excepting for a slight irregularity of the pupils. The patient's temperature was 98; pulse, 68; respirations, 18; blood pressure, 140 mm. A blood examination showed 4,778,000 red blood cells, with 9,600 leucocytes. A differential count showed neutrophiles, 62; large lymphocytes, 15; small lymphocytes, 22; transitionals, 1. The morphology was negative, as were also two serum Wassermann tests. Urinalysis was negative; the von Pirquet test was negative. C. S. Fluid exam.: Wassermann negative; no. of cells per mm. 8; marked excess of globulin; Fehling reduced

The patient was kept under observation for twenty-eight days, during which time there was a gradual progression of symptoms: areas which previously showed a sensory diminution became anesthetic, the abdominal and epigastric reflexes disappeared, and the left exhaustible clonus became inexhaustible. The cramp-like pains became more severe and frequent, requiring the use of morphia. Frequent catheterizations became necessary and the bowels were evacuated only by means of enemata. An X-ray was taken by Dr. Cole, which showed a circumscribed shadow on the right side of the spinal column, opposite the sixth cervical vertebra, which was apparently just in front of the transverse process. The case was referred to Dr. Alfred S. Taylor, who did a hemilaminectomy on December 10. Four days after the operation, an examination revealed an exhaustible clonus, and pin pricks were felt acutely by the patient over the previously anesthetic areas. On December 18 the patient was able to move his legs voluntarily, and from this time on his condition gradually improved. On December 26, with some assistance, he was able to walk the length of the ward and the bladder and rectal functions were restored. He had an occasional "cramp," but never required opiates.

Dr. Alfred S. Taylor, who performed the operation in this case, said there were one or two points in connection with it that perhaps should be brought out with a little more emphasis. Early in the course of this man's illness he developed what was regarded as an abscess at the junction of the sternum and the second costal cartilage. This was opened, but after two or three months it still contained some old, chronic inflammatory material: it appeared as a distinct swelling, slightly tender, and was very suspicious of a gumma. Of course, the fact that the Wassermann reaction was negative rather militated against that theory, and the abscess was possibly of tubercular origin. The von Pirquet test, however, was also negative.

Another suggestive point was the evidence of the presence of inflammatory material on both sides of the spine over the actual seat of the trouble. The transverse processes of the fifth, sixth and seventh cervical vertebræ were more or less indistinct in outline on account of the presence of this material.

Dr. Taylor said the operation he had done in this case was an exploratory right hemilaminectomy. There was nothing unusual observed in the laminæ themselves. When, however, the laminæ were removed and one came down on the dura, the latter seemed to fill the entire spinal canal. The cord itself was somewhat congested, so that it entirely filled the dural cavity, interfering with the flow of spinal fluid. The cervical canal, instead of widening as it ordinarily did, was distinctly narrowed. Apparently, there must have been a combination of a congenital malformation, plus some inflammatory condition of the cord. In completing the operation, the dura was not sutured. The bone was not replaced and the muscles were sutured.

Dr. Hunt said that syphilis of the vertebral column is rare but should always be considered in cases of spondylitis. The cervical region is most frequently involved in this group of cases and the meninges or the cord may be compressed or directly involved by syphilitic proliferation at the same level. In the case reported by Dr. Taylor and Dr. Stephenson a syphilitic periosteitis and osteitis with consecutive peripachymeningitis should be considered as a possible clinical diagnosis.

Dr. Clark said he did not think we were justified in ascribing the condition in this case to syphilis, as that diagnosis was not borne out by the serological tests. While these spinal decompression operations often prove apparently beneficial, the speaker said he was inclined to believe these cases should be investigated a little closer and sifted out a little finer before an operation of this kind was recommended. Although a decompression operation was beneficial in a certain few cases, it was still a rather questionable procedure in cases where the diagnosis was obscure.

Dr. Larkin said that from the presentation of the case, as made by Drs. Taylor and Stephenson, he did not think a diagnosis was at all possible. A syphilitic osteitis or periosteitis, such as had been suggested, could easily have been demonstrated from its objective features. A specific inflammation of the meninges of the dura spinalis would certainly have showed some objective features to give rise to such phenomena as this man had presented.

Dr. Foster Kennedy said he did not agree with Dr. Larkin that a syphilitic pachymeningitis always presented such clear objective features that it could not well be mistaken for anything else. When one has cut down on the cord and found an inflammation of the dura mater, it is not always easy to say whether it be tuberculous or of specific origin.

Replying to Dr. Clark, the speaker said he saw no objection to advising an exploratory operation in a case of this kind. The man had certain definite symptoms pointing to a certain area of the cord: he was obviously growing worse, and even if the operation had failed to produce any improvement in his condition, it would still have been warranted.

Dr. S. P. Goodhart said he did not think conditions similar to this were so very uncommon, and he recalled a case, in his practice, operated on by Dr. Taylor about two years ago, in which the condition was practically the same. The operation, as in this instance, consisted of a decompression. That patient was seen by Dr. Dana, who concurred in the diagnosis of suspected neoplasm. A decompression was done, both for relief of pressure and for exploration, and although no tumor was found, the patient improved very much. There was no other way in which she could possibly have obtained that relief. The cord at the site of operation showed congestion. The motor and sensory symptoms before operation pointed positively to a localized lesion at approximately second dorsal segment. Decompression and exploration in these cases is justified and even imperative.

Dr. J. F. Terriberry said he understood that anti-syphilitic treatment was not given a trial in this case, as it was taken for granted that the condition was not specific, based on the pathologist's report. Was that a safe and sound doctrine? Was it right to proceed surgically in a case of this kind before giving the patient the benefit of a thorough course of anti-syphilitic treatment. The speaker said he recently saw a case with a condition of the ribs very similar to that described in this instance, and the lesion cleared up entirely under specific treatment.

Dr. Taylor, in closing, said he had not made the statement that the spinal lesion was specific; only, that the so-called abscess on the rib looked like an old gumma, but that the laboratory tests had barred out syphilis. The test of the serum and spinal fluid both gave negative results. Replying to Dr. Terriberry, he thought we were not justified in losing time by subjecting a patient in such a condition and one who showed no evidence of syphilis to a course of antisyphilitic treatment when that time could be used to better advantage. The bones of the spine did not show any evidence of disease; as far as could be made out, they were normal in appearance. Nothing abnormal was observed until he reached the dura, which might have been slightly thickened, but this was doubtful. The leptomeninges seemed thickened and congested, as was the entire exposed cord. The entire spinal canal was occupied by the congested cord, leaving no room for spinal fluid, and it seemed reasonable to suppose that we had to deal here with an old chronic inflammatory process, with resulting symptoms due to compression of the cord.

THE TRAUMATIC NEUROSES: A RETROSPECT AND A FORECAST

By Pearce Bailey, M.D.

Considered retrospectively, the traumatic neuroses fall naturally into three periods: First, the initial, organic period of Erichsen; second, the functional period, made possible by the work of Charcot; and, third, the modern, analytical period, which had encouraged the psychological dismemberment of hysteria. While these disorders existed before Erichsen's time, their history dated from the appearance of his book, which came stamped with the great authority of England's foremost surgeon. It had an enormous sale, ran through many editions, and its influence even to-day was not entirely eradicated. By publishing the amounts of money paid plaintiffs by corporations which had injured them it showed how important a railway injury might prove as a personal asset and brought to the attention of medical men and lawyers alike the devastating effects which railway and allied accidents might exert on the human nervous system. Under the heading of "spinal concussion," a term no one knew the exact meaning of, Erichsen brought together a great number of clinical conditions which had no relation to one another excepting insofar as any of them might appear in the victims of railway or other casualties.

As knowledge of the anatomy and physiology of the nervous system and the symptoms of its diseases progressed, some of the errors of Erichsen's work became apparent. It became evident that a fracture of the spine was the same whatever the accident that caused it, and that locomotor ataxia, developing in direct sequence to a railway collision, did not disprove that the man who developed it had syphilis, or that he would not have become ataxic without any accident. But while these frankly organic cases found their true place with advancing knowledge, it took much longer for the purely functional nature of imposing physical symptoms to be recognized, and when this happened, in Charcot's great days at the Salpêtrière, the traumatic neuroses entered upon the second or functional period of their history. For many years, during this period, the traumatic neuroses consisted of traumatic hysteria, such as Charcot described, and of traumatic neurasthenia. There were other neuroses advanced from time to time as characteristic of accidents, but these two were the chief and most important ones.

A true traumatic neurosis, in which the question of fraudulent simulation can be excluded, may be regarded as a more or less subconscious expression on the part of the plaintiff of his wishes or of his fears, his mind having been thrown back to a more primitive state by the accident. With the high money premium put on personal injuries, it was easy to see in what way these wishes might point, but the desire for financial profit, while it was doubtless important, had, in the reader's opinion, been very much overestimated in the original genesis of this affection. It seemed to him in a very long experience that a desire for revenge against the person who had injured him was a very much more potent force in determining the changes in personality. He had yet to see a plaintiff who was not extremely bitter against the offending party.

Dr. Bailey said the study of the traumatic neuroses had always been hindered by the fact that it rarely was possible to get at all the conditions of the case, and they had rarely been studied from the analytical point of view which had thrown so much light upon neuroses of other origins. If the hypothesis which he had set forth was correct, the explanation of every traumatic neurosis must be found in disturbances of consciousness: the accident affected consciousness more or less violently, and at once began to loosen restraint in the subconscious regions. The individual symptoms of traumatic neuroses, namely, the hemiplegia, the paraplegia, the blindness, etc., which had been regarded hitherto as the most important, seemed to him important only insofar as they gave a clue to mental motives: they were the clinical expression of fear or desire; their particular form was determined partly by the general makeup of the patient and partly by environmental conditions.

Outlook.—Statistical inquiries undertaken for the purpose of deciding what proportion of cases of traumatic neuroses recovered had always been extremely baffling. It had rarely been possible to secure accurate information of a sufficiently large number of injured persons one or two years after the accident to make the results adequate. The writer's own experience with cases designated as traumatic hysteria had been that before the legal case was terminated, there was little or no improvement; that after the case, as such, was terminated, there was eventually disappearance of the physical symptoms, such as paralysis, etc., in almost every case. This recovery did not occur immediately, as claim agents maintained, and might be delayed several months or years.

Dr. Clark, after complimenting Dr. Bailey upon his excellent presentation of this subject, said he agreed with the writer's view in regard to the outlook in these cases of traumatic neuroses, and thought it was unfortunate that some psychanalyses had not been made in order to learn the actual outcome of these cases after so-called recovery had taken place. Even an ordinary analysis of a large material after litagation had not been undertaken.

Dr. Steinach said he thought Dr. Bailey had taken a rather one-sided view of the subject. In the case he had shown to-night, for example, the injury had occurred over twenty years ago and there had been no thought of litigation. Some of these patients, at least, were not actuated by feelings of revenge or financial profit.

Dr. W. J. M. A. Maloney said the personal experience related by Dr. Bailey was very interesting, especially the fact that the sense of fear developed afterwards. Quite a lot of data bearing on this very point had been collected through the Society for Psychical Research.

Dr. Goodhart said that Dr. Bailey, in regarding revenge as a potent factor in determining the changes in personality in many of these cases, really overlooked the essential point in the psychopathology of the situation, as he had endeavored to co-relate it in his scheme. Revenge, as asserted in those cases, was purely a voluntary conscious reaction; the real activity of the subliminal consciousness expressed itself later in the development of a true fear neurosis, out of which the various forms of phobia might develop.

MESCALINE AND THE PSYCHOLOGY OF OPTIC HALLUCINATIONS

Dr. W. J. M. A. Maloney and Dr. A. Knauer presented a paper on this subject, which was briefly discussed by Drs. Kennedy, Rosenbluth and Onuf. This paper will appear in full in the JOURNAL.

THE PHILADELPHIA NEUROLOGICAL SOCIETY

January 24, 1913

The President, Dr. John H. W. Rhein, in the Chair

Dr. Charles H. Frazier presented a case operated on for pituitary disease.

Dr. William G. Spiller asked whether there had been any necrosis of bone at the site of the scar.

Dr. Frazier stated that he had had three recent cases of operation for pituitary disease. In one case the bone did not heal in as well as the others. The fourth case is in the hospital now and seems to be without any complication at all. It is necessary to determine just what part the size and position of the frontal sinus is going to play. The case in which the result was not as satisfactory as in the others was one in which there was a very large frontal sinus. Dr. Frazier stated that he would endeavor to transilluminate before resecting.

A CASE WITH CEREBELLAR SYMPTOMS

By Alfred Gordon, M.D.

A man of 35 had an attack of paratyphoid fever about six months ago. During convalescence he observed some ataxic movements in his right arm and a little later also in the right leg. Soon he noticed the same manifestation in the left arm and leg. When he left the hospital, at the end of seven weeks, he observed he could not walk straight. There was a tendency to walk to the right. Occasionally he would have headache.

Present Condition.—Patient complains of severe headache, although not continuously. His gait is very peculiar. He cannot hold his body erect. As soon as he stands up, the right side gives way and he would fall if not supported. While he walks, there is a tendency to bend and fall to the right. The bending or doubling up is very conspicuous and pronounced either in standing or walking. Any movement, walking or even crossing his legs, is followed by extreme exhaustion. The asthenia is marked after each examination of the lower or upper extremities. He has difficulty in crossing his legs; in fact he cannot do it unless he helps with his hands. He feels his legs very heavy when he walks. Raising his thighs or throwing out his legs is very imperfect. The knee jerks are exaggerated equally on both sides. The toe phenomenon is not constant: at times present and at others not obtainable, but downward flexion of the toes is not observed. Ankle clonus on the left side is also inconstant, absent on the right. The upper extremities present a distinct intention tremor more on the right than on the left. They are also animated with an involuntary tremor but only at intervals. The latter is particularly observed when he is told to move any other part of his body, as for example in the attempt of crossing his legs. In this particular act his legs also tremble. In addition to tremor there is also ataxia of the upper limbs, which can be demonstrated by finger-to-nose movement. The eye examination shows beginning optic atrophy in both eyes. There is no nystagmus, no ocular palsies. Sensations are intact. Astereognosis is very slight in right hand, but absent in the left. Adiadochokinesia is marked in both arms. The sphincters are intact. The Wassermann reaction is negative. The diagnosis is probably cerebellar disease.

Drs. C. W. Burr and G. B. Crowe exhibited a man showing mirror writing and curious associated movements without palsy.

Dr. Augustus A Eshner inquired whether there was the same amount of power in both hands as demonstrated by the dynamometer.

Dr. Crowe said the dynamometer test had not been tried, but the man's grip had been tried by ordinary methods and he had not shown any difference in the two hands. One hand is as powerful as the other. He can use one hand in ordinary work as well as he can the other.

Dr. J. Hendrie Lloyd asked whether the man could write anything in this way, or whether it was only a few words he had been trained to write. He asked him to write Constantinople simultaneously with the right and left hands. Dr. Lloyd asked whether the man could write the word mirror fashion without at the same time writing the other way with the other hand.

Dr. Alfred Gordon inquired whether the man could write normally with his left hand.

Dr. Crowe said no, that the man could not. The mirror writing showed up better if it were done on paper and held up to the light.

Dr. McCarthy suggested a possible hemorrhage into the medulla during labor. The possibility of a double lesion occurring in both arm centers at the time of birth seemed a thing to think of, but occurring exactly in corresponding areas did not seem exactly plausible.

Dr. Alfred Gordon said he had known a man who did mirror writing. He had no associated movements, in fact was normal in every way. He had no cerebral or spinal lesions at any time. Our present knowledge is very limited as to the cause of mirror writing. No one can give an explanation of the mirror writing because it has been encountered in normal individuals as well.

Dr. W. G. Spiller said that we may believe that each hand in this man is innervated from both sides of the brain equally or both may be innervated from one side of the brain alone. Dr. Spiller said he had in his possession the brain of a man who had porencephalus and complete absence of the anterior pyramid on one side, and on the other side the anterior pyramid was about twice the usual size. The man had walked and drilled and yet had only one pyramid, and the movements on both sides of his body must have been accomplished from one side of his brain. It would be extremely interesting to know if the man shown had an analogous condition, whether one side of the brain caused contractions on both sides of the body. The man had some congenital weakness of the upper limbs lasting for a certain time after birth. It is possible that the brain had not learned to take control of the hands until some period after birth, in aphasia when a child has a lesion in the left cerebral hemisphere the right hemisphere assumes the speech functions.

Dr. Augustus A. Eshner said it seemed to him that the absence of all symptoms excepting these phenomena, which perhaps are not deserving of the name of symptoms, could preclude the idea of a gross lesion at birth. Dr. Eshner said he was in accord with Dr. Spiller's explanation and it seemed to him that there was a more nearly symmetrical development of the fibers and cells coming therefrom innervating the two upper extremities so that both hands are controlled equally by both sides of the brain. He would suspect that this apparent paralysis of birth was due to this condition. The child lacked the normal innervation, he exhibited naturally the incoordination that goes with infancy and that there was really no paralysis but merely this condition of motility. It seemed to Dr. Eshner that if there had been coarse lesion of any sort there would have been contractures. It seemed to him that we had here merely an anatomical anomaly, with corresponding physiological manifestations.

Dr. William G. Spiller presented a case of Freidreich's ataxia with exaggregated patellar reflexes and bladder disturbances.

Dr. S. D. W. Ludlum and Dr. G. L. Howell read a paper on blood pressure in nervous affections.

Dr. John H. W. Rhein read the presidential address entitled "A Consideration of Some of the Phases of the Insanity Problem."

Dr. Moulton said he thought the Society was under very great obligation for the presentation of this subject which had been so ably done. A few points as the reader had gone along in his paper had impressed themselves upon his mind and there were only one or two things he would like to say. Dr. Moulton thought with the reader that the care of the insane, the treatment of the insane by the states is very much in advance of that by local authorities, of county authorities or of similar local almshouse authorities. He was very strong in his conviction in regard to this. He thought this was proved by the fact that the Board of Charities in this state felt that they have made a mistake in the establishing of so many almshouse hospitals throughout Pennsylvania as shown by the fact that they are retracting. If Dr. Woodbury were present Dr. Moulton said he was sure he would bear him out in this statement. Some years ago Wisconsin was often spoken of as an example of local care. Pennsylvania copied largely after the Wisconsin system. Dr. Moulton said he had never visited the institutions in Wisconsin, but it was a noteworthy fact that Wisconsin, which has such a preponderance of almshouse hospitals, is the only state in the union in which there is a company solely engaged in the manufacture of restraint. The causation of psychoses is, of course, a subject of very greatest importance and he thought with the president that public lectures should be given and the public should be taught, the community educated as to what is rife in the causation of the psychoses, heredity of various kinds, alcoholism, the marriage of the unfit, etc. There is an apparent accumulation, a very large accumulation of the psychotic. Dr. Moulton thought, however, that the accumulation is among the poor; there is not very much increase, if any, among the well to do, the people who ordinarily are well fed. It is the poor. The people who come to our shores half starved, who when they get here in changed conditions of life struggle for an existence and drink and go to the wall. If the United States could control the immigration, could weed out the unfit, he believed there would be very much less need of a constant increase in our hospital accumulation. The apparent increase is, of course, considerable. Dr. Moulton thought we might say accumulation rather than increase. There was a very great accumulation in all our hospitals. Dr. Moulton said he did not suppose there was more than 10 or 12 per cent. in our hospitals at any time that are going to get well. Most of them drift on into a chronic psychosis. A certain number die, but the amount of recovery is very small. The percentage of recovery is low. The necessity of having psychopathic hospitals is of very great importance. Dr. Moulton said he would not attempt to say very much about that as the president had described quite accurately the Psychopathic Hospital in Boston, which he believed was one of the best. The Pennsylvania Hospital at 8th and Spruce has for many years maintained an out-patient department for the treatment of mental disorders. He thought its work had been rather disappointing to its promoters. Every year there are some persons who are very much benefited by the treatment there. During Dr. Moulton's service he had a service of three months each year. During his service he felt certain that there was at least one cured by treatment there, who is saved from going to a mental hospital, but there is a small proportion of actually acute cases coming there. A considerably large number of chronic cases, the cases which come over and over again.

Dr. Henry Cotton, Trenton, said he wanted to second Dr. Moulton's commendation of the paper read by the chairman this evening. It seemed to him it was a very good exposition of the subject from the modern standpoint and pointed out very ably the needs in psychiatric work if we are going to go forward. Dr. Cotton said he wished to emphasize the necessity of laboratory work. He had spoken of this in Boston at the last meeting of the American Neurological Association. He spoke at that time of the necessity of pathological work of original character. He did not mean doing autopsies, finding the cases of paresis and senility. That was being done in a great many laboratories and as Alzheimer points out that amounts to very little; it aids in our diagnosis and assists us in our statistics. We need research institutions. The working out of these institutions is a matter of detail. We have not anywhere in this country institutions comparable to the laboratory at Munich. Alzheimer has twelve to fifteen men in the laboratory working on animal experimentation on phases of the cortex. Monographs from this laboratory are published every year. Alzheimer may be working on a special problem. He draws men to his aid from all over the world, Italy, Spain, America, and these men are all working on the same problem at the same time, that Alzheimer is doing personally, so there may be ten Alzheimers working. Whereas in this country there are one or two men working alone. The majority of people look on psychopathology of the cortex as an unfruitful field. You see in the report of institutions that nothing has come from the study of the cortex. They have not found anything, because they have not looked for it in the right direction. In the last five years Alzheimer has found many new methods which previous to that time were unknown. Dr. Cotton said he did not believe we should make any progress until we knew more about the pathological anatomy. We must have facilities, men who will lead the work and workers who will come in. It ought not to be necessary for a man to go to Munich. In the Phipps clinic at Johns Hopkins Hospital with Dr. Meyer as the head, the work will no doubt be of a very high character. It will be the best in this country. Dr. Meyer has surrounded himself with experienced men of the highest type in this work and we all look forward to the time when we will go to Johns Hopkins.

Dr. W. W. Hawke said he had listened with a great deal of pleasure to this discussion. It covered a very wide field in which he had done a great deal of work, especially as to the statistical part. Some years ago Dr. Hawke said he did a great deal of work for the United States Government and later he took up some work for the city of Philadelphia, and in that work he considered the governments of foreign lands and of this country. Dr. Hawke did not think they kept their statistics there any better than we do. Relative to statements in regard to resident psychologists: Dr. Bancroft was president of the American Psycho-pathological Association and he has made an endeavor to bring New Hampshire to the fore. Dr. Hawke said his experience had been that every superintendent of an insane asylum must be not only a psychologist but he was required to have a knowledge of eugenics, every kind of work, office and statistical work, and he himself was compelled to do eugenics work some years ago.

Dr. S. D. W. Ludlum said that it seemed to him that he had listened to papers on the subject of mental disorder and what should be done for a long time. He thought that the president's address combined and brought together most of the work that had been done. It brought together psychiatry, pathology and so on. All of which is very true. We all have learned these individual facts. But there has never yet in this country come a person who has been able to draw any generalization, there has never been an Ehrlich or Virchow who could show us what is the next move. We have almost enough of the details, but we lack the genius who will so make that work that people working in it will continue and be interested. Think of all the money spent at the Sheppard Hospital and at Worcester, Mass. What was the result? We are not working in the right direction.

Dr. George E. Price said he wanted to express his pleasure in listening to this most timely and interesting paper. There was one point which the president mentioned which he would like to emphasize, that was the matter of educating the public. When the mass of the people realized the value of filtered water they demanded it. When they realize the value of these researches they will act. So in regard to these questions as Dr. Ludlum said, there has been an accumulation of views expressed in papers along this line, but as yet the public has not seemed to realize the importance of work along these lines. Back of it all Dr. Price thought lay the old idea that mental disorders are something to be dreaded, to be ashamed of, and he thought if the public could be educated to realize that they are simply forms of illness like typhoid fever, pneumonia, etc., that there are certain rules governing them as to their prevention, they would demand certain of these reforms. Dr. Ludlum spoke in his discussion of no one man to gather together all the work that had been done to point the way. It seemed to Dr. Price that many of these things, like the reform in the care of mental disorders, come slowly. These things come gradually, they develop independently in different countries just as two in one country reach the same conclusion about the same time. So will workers in different countries ultimately point out the new truths in reference to psychiatric work.

Dr. John H. W. Rhein said that it seemed to him to be a great opportunity along the lines of prevention especially. Much can be done, he believed, along these lines, more than along any other line. He thought the lay body did not take sufficient interest in the general public work. They are interested in the scientific results of the laboratory, but he thought they should combine the interest in the economy and humanitarian aspect of the work and this in connection with the importance of psychopathic hospitals—one of the most important purposes of which is the study of the causes of insanity—seemed to him to be two features of great importance in this work

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

OF VIENNA

Translated by Drs. F. Robbins and Smith Ely Jelliffe

Tristan

(Continued from p. 336)

The argument of the Feridun story is pursued in the Tristan saga, as related in the epic poem by Gottfried of Strassburg. This is especially evident in the prologue of the Tristan-saga, which is repeated later on in the adventures of the hero himself (duplication). Riwalin, king in the land of the Parmenians, in an expedition to the court of Marke, king of Kurnewal and England, had become acquainted with the latter's beautiful sister, Blancheflure, and his heart was aflame with love for her. While assisting Marke in a campaign, Riwalin was mortally wounded and was carried to Tintajole. Blancheflure, *disguised as a beggar maid,* hastened to his sick bed, and her devoted love saved the king's life. She fled with her lover to his native land (obstacles) and was there proclaimed as his consort. But Morgan attacked Riwalin's country, for the sake of Blancheflure, whom the king entrusted to his *faithful retainer* Rual, because she was carrying a child. Rual placed the queen for safekeeping in the castle of Kaneel. Here *she gave birth to a son and died, while her husband fell in the battle against Morgan. In order to protect the king's offspring from Morgan's pursuits,* Rual spread the rumor that the infant had been born dead. The boy was named Tristan, because he had been conceived and born in sorrow. Under the care of his *foster-parents,* Tristan grew up, equally straight in body and mind, until his fourteenth year, when he was kidnapped by Norwegian merchants, who put him ashore in Kurnewal, because they feared the wrath of the gods. Here the boy was found by the *soldiers of King Marke,* who was so well pleased with the brave and handsome youth that he promptly made him his master of the chase (career), and held him in great affection. Meanwhile, faithful Rual had set forth to seek his abducted foster son, whom he found at last in Kurnewal, where Rual had come begging his way. Rual *revealed Tristan's descent* to the king, who was delighted to see in him the son of his beloved sister, and raised him to the rank of a knight. In order to *avenge his father,* Tristan proceeded with Rual to Parmenia, vanquished Morgan, the usurper, and gave the country to Rual as a liege, while he himself returned to his uncle Marke. (After Chop: Erläuterungen zu Wagner's Tristan, Reclam Bibl.)

The actual Tristan saga goes on with a repetition of the principal themes. In the service of Marke, Tristan kills Morald, the bridegroom of Isolde, and being wounded unto death, he is saved by Isolde. He asks her hand in marriage, for his uncle Marke, fulfils the condition of killing a dragon, and she follows him reluctantly to Kurnewal, where they travel by ship. On the journey they partake unwittingly of the disastrous love potion, which binds them together in frenzied passion. They betray the king, Marke, and on the wedding night Isolde's faithful serving maid, Brangäne, represents the queen, and sacrifices her virginity to the king. Next follows the banishment of Tristan, his several attempts to regain his beloved, although he had meanwhile married Isolde Whiteland, who resembled her. At last he is again wounded unto death, and Isolde arrives too late to save him.[41]

A plainer version of the Tristan-saga, in the sense of the characteristic features of the myth of the birth of the hero, is found in the fairy tale, "The True Bride," quoted by Riklin ("Wünscherfüllung und Symbolik im Märchen," p. 56) from Rittershaus' collection of fairy tales (XXVII, p. 113). A royal pair have no children. The king having threatened to kill his wife, unless she bears a child by the time of his return from his sea-voyage, she is brought to him during his journey, by his zealous maid-servant, as the fairest of three promenading ladies, and he takes her into his tent without recognizing her. She returns home without having been discovered, gives birth to a daughter, Isol, and dies. Isol later on finds a most beautiful little boy in a box by the seaside, whose name is Tristram, and she raises him to become engaged to him. The subsequent story, which contains the motive of the true bride, is noteworthy for present purposes only in as far as here again occur the draught of oblivion, and two Isoldes. The king's second wife gives a potion to Tristram, which causes him to forget the fair Isol entirely, so that he wishes to marry the black Isota. Ultimately he discovers the deception, however, and becomes united with Isol.

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[41] Compare Immermann, "Tristan und Isolde, Ein Gedicht in Romanzen," Düsseldorf, 1841. Like the epic of Gottfried of Strassburg, his poem begins with the preliminary history of the loves of Tristan's parents, King Riwalin Kannlengres of Parmenia and Marke's beautiful sister Blancheflur. The maiden never reveals her love, which is not sanctioned by her brother, but she visits the king, who is wounded unto death, in his chamber, and dying he procreates Tristan, "the son of the most daring and doleful love." Grown up as a foundling in the care of Rual and his wife, Florete, the winsome youth Tristan introduces himself to Marke in a stag hunt, as an expert huntsman, is recognized as his nephew by a ring, the king's gift to his beloved sister, and becomes his favorite.

ROMULUS AND REMUS

The original version of the story of Romulus and Remus, as told by the most ancient Roman annalist, Fabius Pictor, is rendered as follows by Mommsen.[42] "*The twins* borne by Ilia, daughter of the preceding king Numitor, *from the embrace of the war god Mars were condemned by King Amulius, the present ruler of Alba to be cast into the river.* The king's servants took the children and carried them from Alba as far as the Tiber on the Palatine Hill; but when they tried to descend the hill to the river, to carry out the command, they found that the river had risen, and they were unable to reach its bed. The tub with the children was therefore thrust by them into the shallow water at the shore. *It floated* for a while; *but the water promptly receded,* and *knocking against a stone, the tub capsized,* and the screaming infants were upset into the river mud. *They were heard by a she-wolf who had just brought forth and had her udders full of milk; she came and gave her teats to the boys, to nurse them,* and as they were drinking she licked them clean with her tongue. Above them flew a woodpecker, which guarded the children, and also carried food to them. The father was providing for his sons: for the wolf and the woodpecker are animals consecrated to father Mars. This was seen by one of the royal herdsmen, who was driving his pigs back to the pasture from which the water had receded. Startled by the spectacle, he summoned his mates, who found the she-wolf attending like a mother to the children, and the children treated her as their mother. The men made a loud noise to scare the animal away; but the wolf was not afraid; she left the children, but not from fear; slowly, without heeding the herdsmen, she disappeared into the wilderness of the forest, at the holy site of Faunus, where the water gushes from a gully of the mountain. Meanwhile the men picked up the boys and carried them to the chief swineherd of the king, Faustulus, for they believed that the gods did not wish the children to perish. *But the wife of Faustulus had just given birth to a dead child, and was full of sorrow. Her husband gave her the twins, and she nursed them; the couple raised the children, and named them Romulus and Remus.* After Rome had been founded, later on, King Romulus built himself a house not far from the place where his tub had stood. The gully in which the she-wolf had disappeared has been known since that time as the Wolf's Gully, the Lupercal. The image in ore of the she-wolf with the twins[43] was subsequently erected at this spot, and the she-wolf herself, the Lupa, was worshipped by the Romans as a divinity.

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[42] Mommsen, Th., "Die echte und die falsche Acca Larentia"; in Festgaben für G. Homeyer (Berlin, 1891), p. 93, et seq.; and *Römische Forschungen* (Berlin, 1899), II, p. 1, et seq. Mommsen reconstructs the lost narrative of Fabius from the preserved reports of Dionysius (I, 79-831, and of Plutarch (Romulus)).

The Romulus saga later on underwent manifold transmutations, mutilations, additions, and interpretations.[44] It is best known in the form transmitted by Livy (I, 3 et seq.), where we learn something about the antecedents and subsequent fate of the twins.

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[43] The Capitoline She Wolf is considered as the work of very ancient Etruscan artists, which was erected at the Lupercal, in the year 296 B. C., according to Livy (X, 231). Compare picture on title page.

[44] All these renderings were compiled by Schwegler, in his Roman History, I, p. 3 and 4, et seq.

(*To be continued*)

Periscope

Allgemeine Zeitschrift für Psychiatrie

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1. *Hallucinations of Hearing in Ear Disease.*—It is well known that in disease of the sensory apparatus, hallucinations of the corresponding sense sphere sometimes occur. The author reports three cases (two women and one man), all in middle life, in each of whom the ear noises accompanying chronic middle ear disease, gradually came to be interpreted as voices, which scolded or threatened, as music, etc. In two of the cases there were other signs of mental disease, but of a subordinate character. In the other, the hallucinations seemed to be an isolated occurrence in a person not insane at the time and capable of estimating them correctly. All were handled as ambulant patients and each improved greatly under treatment of the ear condition. For the production of hallucinations as a consequence of local disease, the author thinks that a certain psychotic predisposition, or some local cerebral disease is necessary. In each of his cases these two conditions were combined. All showed some arteriosclerosis. In one woman there was insane heredity, the other presented manic-depressive symptoms and had already had several attacks of psychical disturbance. The man was undergoing a dementing process and later committed suicide.

2. *The Mechanism of Delusion Formation.*—Current attempts at connecting known facts of brain anatomy and physiology with the psychical mechanisms are criticized as one-sided and lacking in broadness. Brain anatomy, psychology and morphology must work together to furnish a satisfactory explanation of the mental mechanisms. Especially are previous conceptions with regard to aphasia criticized, while the method of restoration of function in aphasics is discussed. The author thinks that both sides of the brain possess the necessary speech mechanisms, but that those of the left hemisphere are habitually used, hence acquire greater facility. Nevertheless it seems entirely possible and practicable for the centers of the right hemisphere to be educated up to taking on the work, when those of the left side have their function impaired. While little understood, the affective sphere is not less important than the intellectual and must be considered in any study of the mental mechanisms, since it is well known that the latter is greatly influenced by the former. While it has been previously suggested that the emotions have a representation in the subcortical centers, the author thinks that they are probably located in the cortex, in some of the so-called silent areas and brings anatomical and physiological considerations to the support of his views. That the various brain centers are influenced in their functionating by conditions of

blood supply, or as some authors have suggested, through states of oxygenation, seems probable, and our author is of the opinion that vascular conditions in the well-defined centers of the central and posterior regions may be affected by influences coming from the less known regions where he locates the emotional centers. Hence the influence of the emotions upon ideas and conduct. It is well known that delusions may arise upon the basis of an inability to correct morbid ideas arising from a pathological emotional tone. Why this inability? The melancholic overpowered by his depressive emotions shuts off all corrective impressions from without. Not so the paranoiac whose reasoning processes remain in general acute and logical. In him the corrective ideas are not wanting, but they fail to bring with them that sense of relief and well being, which comes to the normal individual with the correction of morbid ideas, by normal contraconceptions. A normal person who has been beset with morbid anxieties concerning a loved one experiences an immediate sense of relief upon the appearance of this being, sound and well. The paranoiac on the other hand cannot feel this satisfaction and content, and while recognizing the familiar figure, insists that there is a deception, someone is masquerading as his friend, etc. Our author would explain the development of a delusional system upon the basis of an exaggeration of the natural physiological antagonism between the cortical sense centers and the silent areas of the cortex (emotional centers) which can act and react upon each other, presumably through vaso-motor influences.

As a paradigm, he traces the development of a system of persecutory sexual delusions, in a man between thirty and forty years old, to which he attributes as a basis a faulty emotional tone, resulting from chronic sexual hyperesthesia.

3. *Refusal of Food by the Insane.*—Since to maintain the nutrition is one of the most important indications in the treatment of the psychotic, refusal of food is one of the most serious symptoms and needs prompt recognition and careful management. The refusal may be partial or complete and may last for a short or a long time. Upon its extent and our ability to control it, the prognosis in large measure depends. As to its etiology, the author divides refusal of food into that due to psychic and that to somatic causes, while between the two come those cases in which somatic troubles lead to illusionary conceptions, which in turn cause refusal of food.

The depressive affect always leads to loss of appetite both from general apathy and often from added hypochondriac or religious ideas. The maniac on the other hand has no such feeling, but he is too busy to eat. With him, however, the pangs of hunger are more apt in time to assert themselves and his refusal seldom lasts for so long a time as that of the melancholic. Inhibition without depression may also lead to refusal, and especially is marked in the negativism of dementia præcox. Imperative conceptions may also be a cause of food refusal, but most important as causes are delusional ideas, especially those of poisoning, of unworthiness from great sin and hypochondriac delusions, with regard to the bodily condition. Refusal may be persisted in for a long time from suicidal intent. Fallacious perceptions of all sorts may be at the bottom of refusal, but the author finds illusions, especially those based upon the smell or taste of the food, the more frequent. Hallucinations of hearing or visions in which the patient is commanded not to eat, however, are a frequent and important source of trouble. Again a patient who is having

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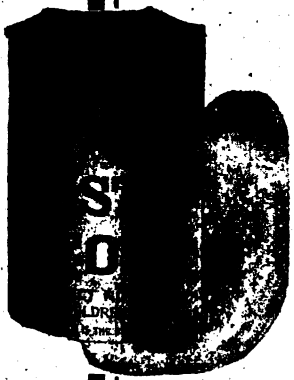

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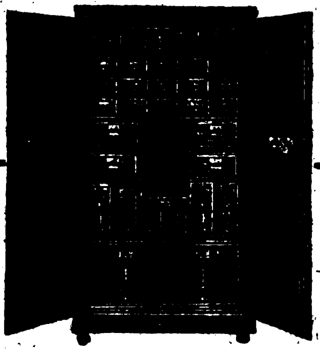

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Original Articles

A PRELIMINARY NOTE ON THE PSYCHIC ACTION OF MESCALIN, WITH SPECIAL REFERENCE TO THE MECHANISM OF VISUAL HALLUCINATIONS[1]

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In the world of psychical things, our experience is always confined within the narrow limits of what we call our own mind. We can gain knowledge regarding psychic phenomena which we ourselves have never consciously experienced only from that which is imparted to us,—only from that which is externalized of the mental processes occurring within the psyche of others. What these others actually experience, we can but faintly realize, for we are wholly dependent upon that which they choose to reveal. If they can but imperfectly express their mental experiences, either verbally or emotionally, we can never attain to any but a vague conception of the actual psychical processes which they are undergoing. If they are reluctant to inform us of what is passing within their consciousness, we must remain practically in ignorance of it. We can just as little decipher their thoughts as we can decipher the thoughts of animals. As psychiatrists, therefore, we must be as chary of deduction when dealing with abnormal minds as we would be as psychologists, when dealing with animals.

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[1] Read before the New York Neurological Society, March 6, 1913.

Seldom can an insane person rationally communicate the essential nature of his disturbed mental processes, and still more seldom are we in a position to compare such a patient's mental picture with analogous pictures from our own experience.

We must therefore realize that, from a strictly scientific standpoint, the subjective abnormal mental complexes, called psychoses, are extremely difficult processes to interpret. We know of them very little. What we do know are usually accompanying objective phenomena, which apparently play no essential rôle in the psychoses; but which are added to, or incorporated with the subjective phenomena.

Obviously we would soon clarify the whole symptomatology of psychiatry, if psychiatrists themselves were in the position to live through all the different psychoses. As this experience is denied us, only one way remains, by which we can hope to reach more light in our science; namely, by administering to one another such substances as will produce in us transitory psychoses.

Kraepelin was the first investigator to endeavor, by means of experimentally induced psychoses, to explore the way to the complicated mental phenomena of the insane. He and his pupils established exact experimental methods, by which they investigated the action of tea, alcohol, morphine, trional, bromide and other drugs upon mental processes. Their researches have yielded valuable advances in psychopathology. Unfortunately, the substances, which Kraepelin and his pupils employed, produce mental states which have little similarity to actual insanities. In Kraepelin's clinic we endeavored further to extend knowledge of pathological mental states by producing mental conditions nearly allied to generally recognized types of insanity, in order to study the mechanism of processes which bore a close likeness to actual mental disease. For this purpose we used the Mexican drag pelotte—the mescal button.

Prentiss and Morgan, Weir Mitchell and Eshner had described the phenomena induced by the mescal button, *Anhalonium Lewinii,*—a favorite narcotic among Mexican Indians, and dilettante drug habitués. Heffter had shown that the active principle of the drug was contained in the alkaloid mescalin. We administered to a number of physicians who volunteered, and several times to each of ourselves, the sulphate of mescalin, the essential principle of this delusional Mexican drug. We made altogether twenty-three experiments. The drug was injected into the subcutaneous tissue of the forearm. It caused an intoxication of a curious and unique nature, which markedly developed in about an hour.

Consciousness, during this intoxication, remained practically unclouded. Its extent was, however, tremendously limited, in a fashion somewhat similar to that which Vogt has described as characteristic of consciousness in hypnosis. In mescalin poisoning, the partial and systematized consciousness of hypnosis is not absolutely reproduced: in mescalin poisoning, attention is not so restricted as in hypnotic conditions. Although attention is directed to one subject at a time, it is not immured in that one subject, as happens in hypnosis, but successively passes from one subject to another. Yet, during a poisoning, while any one subject is under consideration, that subject occupies conscious attention in a much more intense and exclusive manner than normal.

Mescalin and Alcohol.—The mescalin poisoning has also certain similarities with alcohol intoxication, inasmuch as it produces a feeling of increased mental capacity, of ease in mental work. This increase, however, is not, as a rule, objectively substantiated when the capacity for mental work is tested, although the disparity between the amount of mental work done and the feeling of increased capacity is not so evident as is usual in alcohol poisoning. Indeed, in some of the investigated persons, there was not merely a feeling of increased capacity, but actually a demonstrable objective increase in the capacity for a simple mental task, such as reckoning. An increase in the person's capacity for apperception (auffassung) also was usually demonstrable; but, as apperception depends in part upon visual acuity, and, as visual acuity is incontrovertibly enhanced by the action of the drug, this increased apperception may not have been due as much to increased rapidity of the mental processes as to increase in the visual power.

The integrity of the associative and apperceptive faculties is retained in mescalin poisoning. Hence arose one of the features distinguishing mescalin from alcoholic intoxication: viz., that the investigated person, as a rule, seemed outwardly little affected, and appeared to the uninformed not to be under the influence of a powerful intoxicant. The most remarkable feature of the intoxication was hallucinations. Exceptionally, auditory hallucinations were present. Often the hallucinations in the muscular sense sphere were quite astonishing. The following is a brief account of these hallucinations observed in one of the earliest experiments. Time, two and a half hours after the injection of the drug:—

"When standing, I could not walk until I was pushed, and then I unsteadily, stiffly, shuffled along, certain I was going to fall, but improving in confidence and ease of walking with every step. On reaching the laboratory felt faint; could not remember what mechanism to employ to get from the upright to the sitting posture; and was helped to lie down on the floor. Shortly afterwards, to my great surprise, I realized that I had no head, but in its place a sheet of ground glass, such as is used in cameras as a screen. Trying to touch my nose, I, with my eyes open, watching my hand, felt about my chest, neck and face, quite unknowing where I would find it, but I recognized it at once when I did touch it. Where my ear was, was an insoluble mystery; I could not find it so long as with open eyes I followed and controlled the movements of my searching hand. But, with my eyes shut, if I did not attempt consciously to do the task, or to think of what I did, my hand moved accurately to the desired locality. I was quite unconscious of the position of any part of my body, so long as it was still, but if it were moved for me, or if I moved it myself, my power to judge its position immediately awoke. At rest, I felt I had no thighs or legs, only tiny ankles and feet attached to the groin. Yet, on being tested, on being required to perform a fairly complicated movement, I did it almost faultlessly, and during the movement, although the limbs appeared numb and heavy, the real delusion disappeared, *i. e.,* I was no longer conscious of the two little feet in any way existing alongside of, or combined with the sensation of my moving legs.

Visual Hallucinations.—Subjectively, the visual sensibility was tremendously increased. This hyperesthesia we objectively demonstrated for color, by means of Marbe's color wheel. The sharpness of contour which all objects seemed to have, while very apparent subjectively, we failed to demonstrate objectively.

Soon after the onset of the visual hyperesthesia, to nearly all of the investigated persons, out of total darkness, kaleidoscopic pictures appeared.

The following excerpts from the report of a poisoning will perhaps suffice to convey the general trend of the visual hallucinations. Time, four hours after injection.

"Immediately before my open eyes are a vast number of rings, apparently made of extremely fine steel wire, all constantly rotating in the direction of the hands of a clock; these circles are concentrically arranged, the innermost being infinitely small, almost point like, the outermost being about a meter and a half in diameter. The spaces between the wires seem brighter than the wires themselves. Now the wires shine like dim silver in parts. Now a beautiful light violet tint has developed in them. As I watch, the center seems to recede into the depth of the room, leaving the periphery stationary, till the whole assumes the form of a deep funnel of wire rings. The light, which was irregularly distributed among the circles, has receded with the center into the apex of the funnel. The center is gradually returning, and, passing the position when all the rings are in the same vertical plane, continues to advance, till a cone forms with its apex toward me. (These changes in position of the vision were probably due to the same disturbance as caused the vomiting associated in this case with the poisoning.) The cone apex recedes, the inner rings of the circle rapidly change color; beautiful crimsons, purples, violets, blues and greens quickly succeed one another. The wires are moving sinuously in groups from below upwards, passing, crossing and recrossing each other, and curving intricately, so as to produce rarely balanced figures, such as are seen in a kaleidoscope. The background to this gorgeous color panorama was first like faintly illuminated ground glass; it is now a silvery tint, and is deepening into a yellow like pure gold. The colors and their shades vary in different parts of the field. The illumination proceeds from a light, or lights moving suddenly from place to place behind the background, and producing wonderful effects of deep shade and bright light contrast, of sudden bursts of light, and equally sudden extinctions.

"On pressing upon my eyes, the whole picture seemed to materialize; the wires became thicker, and much more brightly colored; they now seemed very much nearer, more solid, more real and quite distinct from the background, which apparently remained where I had seen it previously; soon they slowly receded.

"All this occurred within a circular area which had at first been bounded by the outermost of the concentric wire rings, which after all the other rings had disappeared, somehow persisted, without my consciously noticing it.

"The wires are now flattening into bands or ribbons, with a suggestion of transverse striation, and colored a gorgeous ultramarine blue, which passes in places into an intense sea green. These bands move rhythmically, in a wavy upward direction, suggesting a slow endless procession of small mosaics, ascending the wall in single files. The whole picture has suddenly receded, the center much more than the sides, and now in a moment, high above me, is a dome of the most beautiful mosaics, a vision of all that is most gorgeous and harmonious in color. The prevailing tint is blue, but the multitude of shades, each of such wonderful individuality, make me feel that hitherto I have been totally ignorant of what the word color really means. The color is intensely beautiful, rich, deep, deep, deep, wonderfully deep blue. It is like the blue of the mosque of Omar in Jerusalem, but there is here no trace of Arabic script on the mosaics. The dome has absolutely no discernible pattern. But circles are now developing upon it; the circles are becoming sharp and elongated at the four points of the compass, and are flattening at the sides; now they are rhomboids; now oblongs; and now all sorts of curious angles are forming; and mathematical figures are chasing one another wildly across the roof. The colors are changing rapidly —from blue green to black, to brown—passing successively through an infinite variety of transitional shades. . . . "

6 hours later: "A beautiful palace, filled with rare tapestries, pictures, and Louis Quinze furniture has been peacefully unfolding itself, room after room, each a little different from all the

rest, all marvelously bright and beautiful, and all colored in the same scheme—violet, cream and gold.

"In these rooms ladies appeared. They were all absolutely without motion, without the slightest suggestion of reality; in fact they were as a series of portraits, or of statue groups, which I was observing in a picture gallery."

Twenty hours later: "Long, light green outlines, suggesting crocodiles, lizards and other reptiles are appearing, but they are all indistinct, remote and unreal; they arouse absolutely no sensation of fear. Gigantic plaster casts, rough and unfinished, suggesting death masks; crude representations of gargoyles, such as ornament the Notre Dame in Paris; grotesque dolls; hideous monstrosities of human birth, preserved in bottles; visions of human intestines, of sections of abdomens, and sections of the pregnant uterus, have been annoying me all night."

It was characteristic of practically all the poisonings that to wavy lines succeeded mosaics; carpets; floral designs; ornaments; wood-carving; windmills; monuments; mausoleums; panoramic landscapes; statuesque men and animals, frequently of unnatural, doll-like form; and finally complete scenes which changed so as to unfold episodes in a connected manner. The pictures were mostly plastic in form, of very sharp contour, painfully bright, and colored as by chalk. The pictures were usually, but not invariably, rich in imaginative content.

The vividness of these hallucinations varied remarkably in the same person in the course of the same intoxication. Sometimes the visions were dark, contourless, colorless shadows; at other times they had a remarkably sharp contour. Usually they were marvelously colored, and not rarely their brightness seemed positively to pain the eyes. Twice definite delusions arose.

Independence of the Hallucination.—The independence of the hallucinations towards thought and will was not quite absolute. Upon intently thinking, or intently willing to see, a particular object, no immediate result occurred; the hallucination apparently continued undisturbed and unchanged. Yet after a longer or shorter interval, obtruding itself upon the panorama of the hallucinations, came another hallucination, one which was directly related with the particular object which had been intently willed. In addition to its delay this self-suggested representation was not a precise reproduction, but merely a distorted effigy of the vision which was desired. Thus, while watching a panorama of a danseuse on a stage, one of us attempted to picture a shoe. He repeated to himself all the separate parts of a shoe, and endeavored by concentration to bring up an hallucinatory image of a shoe. The danseuse continued to dance undisturbed for some time, and then suddenly and unexpectedly there appeared a gigantic misshapen shoe, seemingly moulded in plaster, and colored green.

Hence these hallucinations, though mainly of an objective character, were partly, and remotely under the influence of the will.

The Hallucinations and Visual Images.—In spite of the vividness of the hallucinations, the poisoned person possessed visual images of daily events, just as is normal in reverie. Such visual images occurred synchronously with and separate from the mescalin hallucinations, from which they differed by seeming to have no independent existence; by seeming to belong to the person's own thought, and to be a part of his own personality. The visual images had a personal and intimate relation to the investigated person, which was altogether absent in the hallucinations. The visual images could be controlled, changed and recalled as in normal life, but not with quite the same facility.

The hallucinations always seemed to be something arising outside of and independent of the investigated person. The hallucinations could not be reproduced at will; they came unsought, they were uncontrollable, and they were only remotely interfered with by the will.

As the hallucinations and the visual images can coëxist, as the hallucinations are not subject to the will and the visual images are, and as the relation of the hallucinations to the personality is fundamentally different from the relation of the visual images to the personality—a mescalin hallucination must, therefore, be something quite distinct from a mere visual image; and in mescalin poisoning a visual idea, no matter how vivid, can never merge into an hallucination.

The poisoned person retained all his critique; he recognized practically always that the hallucinations, although independent of his thought, were yet much less objective than any external object with real existence. Although a mescalin hallucination is felt to be much more objective than a mere idea such as a visual image—with but few exceptions, in our twenty-three experiments this objective character was never so intense as to confer upon the hallucination any suspicion of real existence.

Points of Distinction between Mescalin Hallucinations and Peripheral After-images.—Peripheral after-images could be reproduced by the usual methods alongside the hallucinations. These peripheral after-images were easily distinguishable from the hallucinations. They at first alternated with, next coëxisted with, and then merged with the mescalin hallucination. These peripheral after-images always had a totally objective character, and they were much more material and real than the most vivid of the hallucinations produced by the mescaline. Moreover, by moving the eyes laterally, the position of the peripheral after-images in relation to the hallucinations could be made to change; the hallucinations remained stationary in space, the peripheral after-images moved with the eyes. The distance of the peripheral after-image from the eye was short, and varied little; whereas the hallucinations appeared sometimes as far as a stage is from a person in the auditorium; and constantly varied in remoteness, advancing almost up to the person, and then retreating far into the darkness. All the hallucinations were enacted within a visual field, which was as a cone with its apex towards the person, so that the size of the pictures varied only with their distance from the observer; whereas, the after-images were not enclosed within any such well-defined area, but were limited only by the extent of the visual field.

Hallucinations and Central After-images.—A very curious relationship was observed between central after-images and mescalin hallucinations. One of the investigated persons, before his intoxication became manifest, carefully studied a map of a region known to him. Among his first hallucinations was a reproduction of this map, in its most minute details; but, in addition to all the details of the map, a town which was actually omitted in the map appeared in its proper position in his hallucinatory representation of the map. Here was an example of a central after-image being converted into an hallucination, but into an hallucination which corrected and amplified the original object which had given rise to the central after-image.

Fate of the After-images.—The after-images merged ultimately with the hallucination. This phenomenon was very remarkable, for no matter how distinct and how dissimilar the hallucination and the after-image originally were, their ultimate fusion produced an harmonious hallucination. Thus, subconsciously, these two dissimilar apparitions, competing with each other for notice, were compounded actively, so that one apparition alone remained, in which the elements of the hallucination and of the after-image could be detected.

Our experiences seem to indicate that five levels may be distinguished in passing from purely objective imagery to purely objective realization:

First level, the most subjective. The visual image, the visual idea.

Second level. The mescalin hallucination, more fantastic, more objective, but still definitely without suggestion of material existence, although largely independent of the personality.

Third level. The central after-image. A mechanical copy of an objective impression, emerging out of darkness, without spontaneity. This level seems to be just above that of the mescalin hallucinations. Indeed, the hallucinations very frequently began with a display of central after-images of the wires of an electrical apparatus which we had just used, and only gradually acquired an independent character, a character without relation to the personality as regards content.

Fourth level. The peripheral after-image. Totally objective but still not real.

Fifth level. The true objective reality.

Some idea of the relation of these levels to one another is suggested in the following diagram.

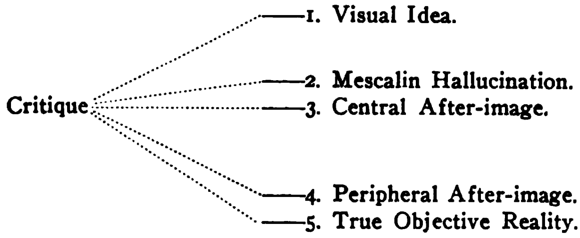
1. Visual Idea.
2. Mescalin Hallucination.
Critique
3. Central After-image.
4. Peripheral After-image.
5. True Objective Reality.

Diagram of Levels in the Visual Sphere.

There exists at present two schools of thought with regard to the hallucinations of the insane. One says that hallucinations are essentially hallucinations, whether they be of very weak, or of very strong imaginative force; the other, that an hallucination is merely a much exaggerated visual idea.

We wish not to side with either school, but merely to state our personal experiences in the matter of these poisonings. All our hallucinations, no matter how weak, or how strong their imaginative force, no matter how feeble their development, remained indubitable hallucinations, and never sank to be merely ideas, the outcome of a vivid imagination.

We feel that this part of our work has only served to show how complex is the question of hallucinations. Whether an idea may become intensified till it merge into an hallucination or not, is only a part of the problem, for hallucinations can involve at least any one of several of the levels which by the action of mescalin we have been able to distinguish.

Definite delusions appeared in several of the investigated persons; had for these persons all the elements of reality; were identical with mescalin hallucinations; and owed their reality mainly to the affection of the critique.

One of us imagined he saw crawling on the wall an insect, of whose material existence he was so convinced that he proceeded to slay it; he then discovered that the object was nothing more than a stationary nail. Another hearing the pencil scratching on the paper on which one of us was recording his hallucinations, thought it was a dog howling, and insisted upon the creature being quieted. Thus the critique sometimes disappeared; but in each of these examples, there was some external stimulus—in the one case the nail, and in the other the scratching of the pencil on the paper—which was wrongly interpreted. Whether or not the existence of this external stimulus was a determining factor in the temporary obscuring of the critique we are not prepared to say. It is noteworthy that the visual hallucination materialized in a darkened room—that is, under circumstances in which our critique of visual impressions normally is somewhat uncertain.

As regards the auditory delusion we may remark that, as only one sound can be heard at a time, whereas visual hallucinations can be perceived together with ordinary external objects, the auditory critique is so much the more liable to disturbance than the visual.

In one instance, however, the hallucinations of muscular sense and of vision were replaced by definite combined delusions. In this person the feeling arose that the body was cut in halves transversely at the waist. Presently he saw the lower half of his body before him, and somewhat to the right side. He became very excited about it, and found that when he moved, the separated part of the body moved with him. He danced vigorously in an effort to restore his former integrity. In this person also other visual delusions occurred. Thus, he saw a French soldier and had to be forcedly restrained from attacking his delusion.

It is noteworthy that we found no indication of the fundamental importance of sexual experience in the content of our artificial hallucinations and delusions, even when special means were taken to elicit it.

In addition to these actions, mescalin produced a most remarkable effect upon the appreciation of time. Persons under the influence of mescalin enormously overestimated time periods. Seconds seemed minutes; minutes seemed hours. One of the investigated persons, who had been left half an hour in the dark, thought he had lived through the whole night in this time. We investigated this phenomenon experimentally, and found that the overestimation although largely subjective was still demonstrable objectively. The results of these investigations, together with the details of our measurement of the power of perception, the power of reckoning, the power to distinguish, the memory, the simple motor reactions, the weight sense, fixed and free word associations, and the visual acuity for colors, will later be published.

THE REBOUNDING PUPIL[1]

By Frank R. Fry, M.D.

ST. LOUIS, MO.

The pupil which I am here designating as rebounding contracts to light and promptly dilates or rebounds to a position which is steadily maintained without alteration in the light stimulus.

Dr. J. W. Charles, Dr. Nathaniel Semple and Dr. William Edler, the two former experienced oculists and the latter constantly associated with me in much of my professional work, have for upwards of two years been observing cases with me in a manner to convince us that pupils behaving as above briefly described present a reaction which deserves attention. For it would seem that under certain circumstances, especially when associated with other abnormal pupillary reactions, it has at least a confirmatory value, and its presence should be regularly noted.

It is found by us frequently in syphilitic and neurasthenic patients. And it is certainly among these two classes that uncertain and puzzling pupillary conditions are most often met, some of them so nondescript that attempted descriptions of them become tedious. And yet every one who tries to observe pupils constantly and carefully is interested in these aberrant phases of reaction. I believe the rebounding pupil is quite frequently to be seen in patients with abnormal and unstable pupillary conditions. I have no doubt it has been observed by many. I have discussed it more or less with a number who have observed it in addition to those whose names I have just mentioned. I believe, therefore, that reliable conclusions as to its frequency or its possible value as a sign may only be reached after many observations and comparisons by competent persons.

To those interested in undertaking a study of this kind it is hardly necessary to mention the detail of methods to be used in obtaining the phenomenon here cited, as the necessary precautions suggest themselves readily enough. For example, there is no difficulty in discriminating between this condition and the usual fluctuations in the size of the pupil observed with alterations in the intensity and position of the light stimulus. Nor will it be confused with hippus, if carefully studied, much less with the rare "paradoxical pupil," nor with a spastic mydriasis, so called, which is an entirely different phenomenon and not often observed. I had thought of venturing some speculations as to the nature of the phenomenon, based on some of the observations I have made on patients, but for the present, at least, would only suggest that it would seem to indicate a lack of tone in the constrictor apparatus of the pupil of variable duration in different instances.

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[1] Read at the thirty-ninth annual meeting of the American Neurological Association, May 5, 6 and 7, 1913.

BLOODVESSEL CHANGES CONSEQUENT ON NERVOUS LESIONS[1]

By T. Wingate Todd, M.B., F.R.C.S.

Obliteration of the lumen of bloodvessels is a subject which has attracted the attention of both laboratory workers and clinicians.

Its importance in the fetal history of the human organism and in relation to bloodvessel surgery has been emphasized in the recent work of many investigators. Just how far changes in the bloodvessel wall and lumen may be responsible for the group of vasomotor disturbances, we have not yet clear evidence. But it would appear that symptom-complexes so widely different at the inception of the disease, as those of Raynaud's disease and erythromelalgia, may ultimately be associated with thickening of the vessel wall and narrowing or even complete occlusion of the blood channel in more or less localized areas of the body. In the laboratory as in the wards there is a growing tendency to associate the morphological alterations in both wall and lumen with some form of "neuritis." In view of the opportunity recently afforded me for the investigation of bloodvessel changes in nervous lesions of mechanical causation, I would venture to discuss the relation of so-called obliterative endarteritis to the neuritis theory.

About the period of early adult life, that is to say somewhere near the age of 25 years, symptoms of paralysis of the lowest brachial trunk are liable to appear in either sex. Briefly these symptoms consist of wasting in the small muscles of the hand supplied by the median and ulnar nerves, together with neuralgic pains, perhaps actual dissociation or even loss of sensation in the cutaneous area supplied by the ulnar and internal cutaneous nerves. These symptoms are usually exhibited by female patients and more frequently occur in the right arm than in the left.

The reason for the greater frequency of the symptoms in women and on the right side is not important in the present discussion and has been considered elsewhere (36) (37). The phenomena presented by these cases were first associated with a mechanical lesion of the lowest brachial trunk as it passes over a cervical rib to reach the axilla (34) (35).

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[1] From the Anatomical Laboratory, Western Reserve University, Cleveland, Ohio.

More recently it has been shown that the same symptoms may be occasioned, under certain conditions, by the mechanical pressure of the first thoracic rib on the lowest brachial trunk (36). They are, indeed, not at all necessarily dependent for their production on the presence of rudimentary ribs at the thoracic inlet. In the present connection however interest does not center around the motor or sensory phenomena but in the vascular symptoms which are frequently found in association with the motor and sensory disturbances previously mentioned. These vascular symptoms include pallor, coldness and cyanosis commencing in the fingers of the affected hand and sometimes extending into the forearm. There may also be localized edema in the hand and in certain cases, dry gangrene of one or more finger tips. The similarity of the above symptoms to those of Raynaud's disease is at once evident.

On examination, the radial pulse will be found less in volume and tension and possibly delayed in time, when compared with that of the sound limb. Or the pulse may be obliterated altogether. In the latter case the solid cord which represents the vessel is liable to be mistaken for the tendon of the flexor carpi radialis. In certain cases the vascular symptoms may be present alone, the sensory and motor condition of the limb being normal. Of such instances one was recorded in the *Lancet* (38) and another more recently in the *Journal of Anatomy and Physiology* (39).

Through the kindness of Mr. Telford, under whose care the patient was admitted for treatment to the Manchester Royal Infirmary, I was able to examine the actual condition of the radial artery in the latter case. The condition which I found is illustrated by Figs. 1 and 2, which represent different magnifications of the cross section of the vessel.

In Fig. 1 the collateral vein is shown. Apart from some hypertrophy of the media this small vein does not display any changes worthy of note. The case of the artery is more striking. Its lumen is almost obliterated by a mass of cellular tissue of doubtful origin. At operation the channel of the artery was shown to be completely occluded at some places as no blood

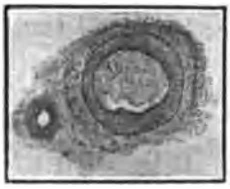

FIG. 1. Transverse section of radial artery and one vena comes from a case of neurotic endarteritis obliterans. Magnified 9 diameters. The outer border of the arterial middle coat has been outlined to show its irregular thickening. Reduplication of the internal elastic lamina can be seen in places. Note the almost complete obliteration of the lumen. The small collateral vein shows some hyperplasia of the media.

flowed when the vessel was cut. The space marked *a* (Fig. 2) would appear to be a loculus representing the original lumen, as it is lined by a definite layer of endothelium; *b* and *c* may possibly be artefacts due to the fixation of the tissue in 10 per cent. formalin in normal saline solution, for they do not show the same definite lining as does *a*. The tissue which caused diminution of channel was soft, translucent, and gelatinous when examined fresh. Under the microscope, it would be difficult to state whether it is composed of an "embryonic" variety of connective tissue cells or of proliferated endothelium or subendothelial tissue. At the point *d* some pigmentation of hemal origin is present, as though red cells had been broken up into debris in this situation. It will be seen later that this does not necessarily indicate the origin of the cellular tissue from organized thrombus, for Lapinski found blood extravasation to occur in some situations in similar cases (23).

At the point *e*, the elastic lamina becomes increased and reduplicated. At first this was thought to indicate the presence of a branch vessel at this site. Serial sections showed that such an explanation is incorrect, but that here and there reduplication of the elastic lamina occurred in the course of the main vessel. In certain areas the media and probably also the adventitia show hyperplasia of the tissue elements.

It may be contended that in the present instances the media and adventitia are not hyperplastic for as Meigs justly observes, until we study the arteries of different regions, not under various degrees of contraction, but uniformly expanded, we obtain wholly false ideas as to the relative development of the different layers (26). There can however be no question concerning the overgrowth of intimal tissue.

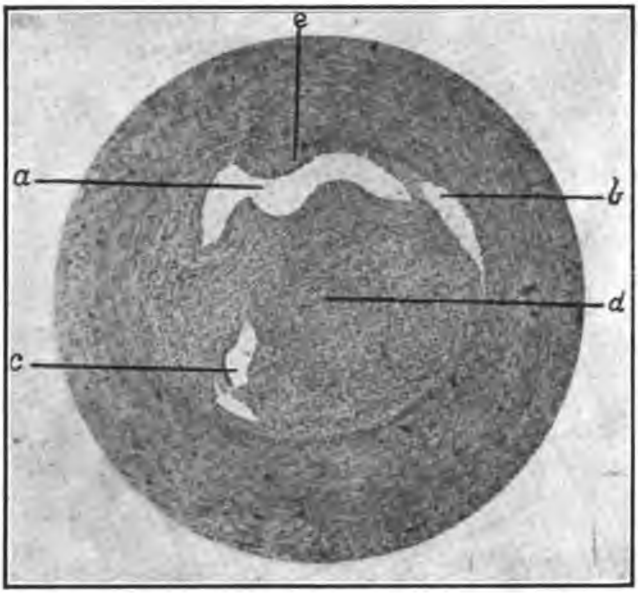

FIG. 2. Transverse section of radial artery from the same case. Magnified 45 diameters.

The illustration shows the occlusion of the lumen by cells of proliferated endothelium. The channel *a* has a definite endothelial lining and contains a few red cells. *b* and *c* may possibly be artefacts as they do not show this definite endothelial lining.

At *d* many red cells, only slightly broken up, may be found among the interstices of the obliterating tissue. In all probability this is not organized thrombus as is shown by the clinical symptoms and pathogenesis of the case.

At *e* is reduplication and triplication of the internal elastic lamina.

In the media there are hyperplasia of muscle cells in localized areas and a break up of elastic tissue. With higher magnification the vasa vasorum are seen here and there and are quite normal in structure.

The adventitia is not shown in this photograph except for a narrow rim of tissue at the periphery of the illustration. In the adventitia the vasa vasorum can be seen to be plentiful and normal as regards their wall and lumen.

I have received considerable criticism regarding a statement previously made by me that the occlusion of the lumen has been brought about by proliferation of the endothelial lining. It has been argued that these cells are subendothelial in origin and are derived from connective tissue.

I would therefore quote Adami in this connection (1). His said that vascular endothelium is a special derivative of the mesenchyma derived from an order of cells that is distinct from the connective tissues. " But, granting that this is so, they are but later developments from a common mesoderm, from which connective tissue and mesenchyme are derived. They are closely related. And we have the observations of practically all recent students of the organization of thrombus, that there the new connective tissue is almost if not entirely derived from the endothelial cells. We do not see how this testimony can be refuted, and, if the process occurs in one region, we fail to see why it should be denied in another. Nevertheless Thoma and Henking are the only ones who have boldly laid down that endothelial proliferation precedes fibroblastic development and is the main origin of the fibroblasts."

Reference to Fig. 2 will show that the intimal overgrowth does not occur equally all around the lumen but is much more pronounced in some regions than in others. The eccentricity of what remains of a lumen and the definite orientation of the proliferated cells bear out this conclusion.

Hitherto the diminished volume and tension of the pulse and its delay in rising to a maximum in cases of cervical rib have been ascribed to stretching of the subclavian artery by the first rib or to squeezing of the vessel between bone and muscle on the contraction of the scalenes in respiration. I was able to show that the former explanation could not hold, in view of the fact that the artery is cirsoid in form as it passes from the thorax to the axilla. Consequently no stretching of the vessel is possible (37) (38). This sigmoid course taken by the artery is illustrated by Fig. 3. Although the case figured is one presenting a true cervical rib which articulates with the seventh vertebra, the illustration shows the normal characteristic course of the subclavian artery.

I have been able to show the second suggestion above mentioned to be erroneous also, namely the squeezing of the artery between scalene muscles and bone in inspiration. For as I have stated elsewhere, scraping of the scalenes from their insertion, and even resection of the offending rib did not result in any improvement of volume or tension of the pulse nor in any alteration in its time (38).

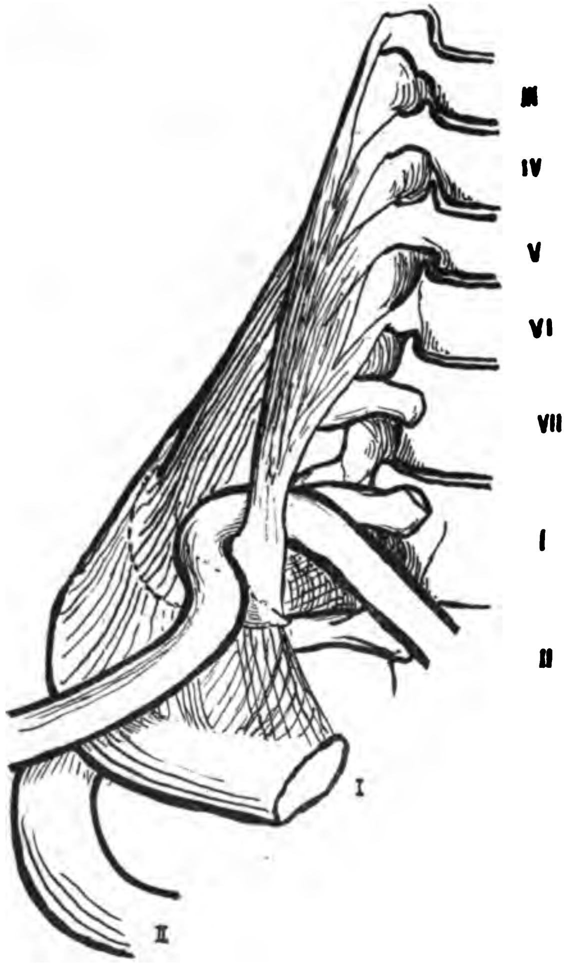

FIG. 3. Right side of cervico-dorsal region in a case of true cervical rib. The rudimentary rib can be seen articulating with the 7th. cervical vertebra. To its anterior extremity is attached the insertion of scalenus anticus. The right subclavian artery is shown passing over the rudimentary rib behind the scalenus anticus.

Note the sigmoid course of the vessel. This sigmoid course is also very marked in children. In normal adults it is present but is less pronounced. Its function is to provide "slack" in the artery to allow for movements of the shoulder and its presence prevents stretching of the vessel in cases of cervical rib.

Fig. 4 illustrates this point. From such a diagram it is easily seen that raising of the thoracic operculum consequent on contraction of the scalene muscles cannot possibly constrict the artery in any way. That the caliber of the vessel is diminished at the summit of its curve is perfectly true. But Poirier has shown that the narrowed portion or *isthmus* of the artery bears no relation to its passage between the scalenes (29).

Stahel has pointed out that this narrowing of the channel is a consequence of the passage of a fluid vein over the summit of a

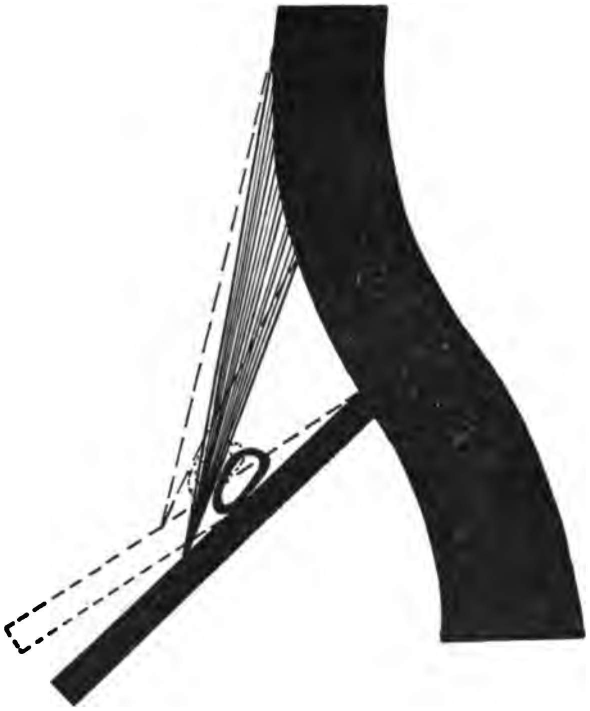

FIG. 4. Diagram to illustrate the fact that compression of the subclavian artery does not take place on contraction of the scalene muscles. The thick curved bar represents the cervico-dorsal portion of the vertebral column.

The thinner straight bar indicates the position of the first rib in expiration. To it runs the scalenus anticus from the cervical column and immediately above it is a circle denoting the position of the subclavian artery crossing the rib. In inspiration, contraction of the scalenes raises the rib to the position represented by the dotted bar. Measurement on the illustration will show that with contraction of the muscles and raising of the rib, there is no possibility of the scalene squeezing the vessel against the bone. There is as much room for the artery in inspiration as in expiration.

curve, and is purely an application of the laws of hydrodynamics to the human body (31).

It is certain that there is frequently some flattening of the vessel as it passes over the first rib. When a cervical rib is present this may be very pronounced, as in Murphy's case (27). I have previously demonstrated flattening of the vessel to be also purely in accordance with the laws of hydrodynamics and not to be ascribed to the close association of vessel and rib at this site (38).

It is not to be denied that extreme and forcible alteration in the position of the arm or shoulder may temporarily affect the pulse, but it is possible to prove that no reasonable or normal attitude adopted by an individual himself will interfere with volume, tension or time of the pulse (36) (40). The truth of the result of investigation on the supposed action of the scalene muscles is supported by the very opposite views held by different authorities on the influence on the pulse of raising the arm. Last year, in London, of two prominent surgical teachers in the same post-graduate course, one held that raising the arm interfered with the pulse while the other was equally dogmatic that raising the arm improved the pulse. As the previous theories of interference with the pulse have been shown to be incorrect it remains to demonstrate the true explanation. It is obvious that the altered volume, tension and time of the pulse, together with the other symptoms, to which reference has already been made in this article, are in reality caused by the pathological changes in the vessel wall and the lumen as outlined above. But an explanation must be given of the cause whereby these changes are produced.

In the first place they are not caused by local damage to the artery. For if this were so, the site of greatest injury would be the crossing of the artery over the rib (thoracic operculum). On the contrary it is in the vessels of the hand where the signs of arterial lesion first make their appearance.

Some transient dilatation of the axillary artery seems to occur in certain cases (34) (27) but this has not come within my own experience.

Simulation of aneurysm by the artery in such a case was recognized by Turner as long ago as 1870 (42).

Genuine aneurysm does not occur. Indeed, as Thorburn says, the artery presents no peculiar relationship to the malformation

(34). On the other hand aneurysm has been recorded after operation (11). This however was in all probability due to local damage to the vessel at the operation, which is not an easy one.

Except after operation, therefore, there is no local cause of damage to the arterial system.

Reference to Figs. 1 and 2 and a review of what has been stated above and in a previous paper concerning the histological appearance exhibited by the arteries in these cases, will readily show that the pathological changes are not due to inflammation. There is no invasion of any of the coats by leukocytes. On the other hand, there is irregular proliferation of tissue elements in all coats. The occlusion of the lumen of the artery is brought about by hyperplasia of the cells internal to the elastic lamina. In a certain area the mass of cells obliterating the lumen contains remnants of blood pigment. The cells in this site may represent organized thrombus. But it is quite possible that the pigment comes merely from red cells which have been snared by the proliferating tissue as the pervious channel became more and more constricted. Or they may be due to local extravasation of blood such as was found by Lapinski to occur in his experimental cases (23).

After careful consideration of the subject it seemed possible to me that the cause of the proliferation of tissue elements might be trophic in nature, especially as certain facts previously noted in the distribution of sympathetic fibers to the arm gave countenance to such a view (41). It will be of interest at this stage to recapitulate what I have previously found concerning the sympathetic fibers to the arm.

In the lowest brachial trunk are to be found numerous nonmedullated and small medullated fibers some of which are found in the first dorsal root but many of which reach the nerve through communications from the sympathetic chain direct as post-ganglionic fibers and as a contribution from the second dorsal nerve. In the latter the fibers are both afferent and efferent (41). In the lowest brachial trunk these fibers lie more or less clumped together. In certain cases they are found on the aspect of the nerve most closely related to the first rib while in other individuals they are more remotely situated in the nerve trunk. As these anatomical findings have been fully discussed elsewhere (41) (38), there is no need to occupy space with any further elaboration here.

It has been shown that the clinical cases may or may not exhibit vascular symptoms in association with the motor and sensory changes. Or vascular symptoms may occur alone. Again, vascular symptoms may precede or follow those more definitely related to lesion in the spinal nerves. And from the preceding paragraph it appears that the distribution of small medullated and non-medullated nerves in the lowest brachial trunk is such as to readily explain the variation of symptoms in different cases. Moreover the result of severing from its proximal connections the nervous plexus on a bloodvessel, has already been discussed, showing that the cells of Bethe have no influence in preventing the degeneration of the nerves to bloodvessels, if the proximal connections of the said nerves have been severed (41). In individuals who exhibit the above clinical symptoms, I therefore suggested that the pathological changes occurring in the bloodvessels might be due to a lesion of the sympathetic fibers in the lowest brachial trunk, although I had not at that time the confirmatory evidence which I now desire to present (38).

To do this, it is necessary to inquire from the literature what relation exists between sympathetic nerves and bloodvessels and what results can be noted in the latter in association with lesions of the former. Both afferent and efferent nerves pass to the wall of bloodvessels. The efferent fibers for the most part terminate in the muscular coat. Afferent fibers connected with a kind of endplate are described in the wall of small bloodvessels (Dogiel) and in the tunica intima of the aorta and pulmonary artery (Schemetkin) and of all cerebral arteries (Huber). Pacinian corpuscles occur in the adventitia of some of the large arteries. But there are also delicate nerve fibers accompanying bloodvessels which are so small that they possess no muscular coat though it is unknown whether these fibers are afferent or efferent in nature (25).

By means of methylene blue, the existence can be demonstrated of special nerves to the smallest vessels. The terminal arteries are always accompanied by a medullated fiber which runs on their surface, giving off here and there collateral twigs and dividing at the same time as the artery itself. Finally the nerve fibril loses its myelin and arborizes, to cover by its terminal ramifications the ultimate arterioles and the capillaries which follow them (18).

Probably the non-medullated fibers are efferent while the small medullated ones are afferent in nature (18).

As to where the vascular nerves arise and how they reach their distribution the following observations give some information. It would seem probable that the efferent fibers are connected with cells in the ganglia of the sympathetic chain (Langley's vertebral or lateral set) which migrate out from the anterior horns of the spinal cord (21). The preganglionic fiber is fine and medullated, while the post-ganglionic fiber is non-medullated (32). These efferent fibers arise in the cat from the 4th to the 10th thoracic nerves (32). In man they may be considered as coming from approximately the same region, for their origin is lower than that of the fibers to the cervical sympathetic, and these last named come off from the last cervical and first thoracic segments of the spinal cord and anterior roots (33).

Many of these efferent fibers join the lowest trunk of the brachial plexus and leave the large nerves from time to time to pass to the several bloodvessels in the area of distribution of these nerves. Thus the exact ultimate segmental origin of the sympathetic fibers is not important for the present discussion. We are only dealing with those which pass to the arm in the lowest brachial trunk.

Many of the small medullated fibers which are afferent in function probably have no connection with the "sympathetic" system but pass direct along the nerve-trunks to reach their cell-stations in the dorsal root ganglia (30). Some afferent fibers however do pass along the white ramus communicans (32).

Exactly how the vascular nerves are distributed to the vessels of the arm, it is impossible at present to say. Although some may be derived from the plexus around the aorta (22), these can only be for the larger vessels in the proximal part of the limb. The more peripheral vessels are supplied directly from the nerve trunks. Because of the unsatisfactory state of our knowledge regarding the distribution of vascular nerves, this subject is at present being investigated in the Anatomical Laboratory here and the results will shortly be ready for publication. But it can be stated that the observation made in a previous communication has been confirmed, namely that the nerve supplying any muscular or skin area also supplies the bloodvessels of that area (39). Hence when changes occur in the musculature or skin of any area as the result of a lesion in the nerve of supply, the bloodvessels will also be liable to exhibit some disturbance.

The method of production of the lesion in the lowest brachial trunk, by means of which the symptoms already mentioned are produced, would seem to be direct pressure rather than stretching. For judging from the stretching and elongation in the seventh cranial nerve, which may occur as the result of cerebello-pontine tumor, without the production of weakness of the facial muscles, gradual stretching does not seem to cause interruption of function, at any rate in an efferent nerve trunk (10).

We may now enquire whether clinical and experimental evidence substantiate the view that obliterative changes, occurring in bloodvessels, by means of hypertrophy and hyperplasia of the several coats more especially the media and intima, are occasioned by a loss of trophic control evidenced by a lesion of the vascular nerves.

Since making histological study of the obliteration of vessels, my attention was directed by Professor Elliot Smith of Manchester to the work of von Bechterew and his assistants in St. Petersburg. Von Bechterew gives an excellent résumé of the work done by previous investigators on the modifications in bloodvessels resulting from section of their sympathetic supply. These changes consist in hypertrophy of the tunica media, while in both intima and media there is also an increase of the elastic lamina (3).

That clinical signs similar to those now classed as vasomotor, do occur on section of the sympathetic, was indicated by Claude Bernard's classic experiment on the rabbit's ear, and was demonstrated by Nicati and Horner at a later date (28).

Lapinski's experimental work on rabbits showed that in 7 out of 14 cases in which he cut the cervical sympathetic, changes occurred in the arteries of the ear, similar to those figured in this article, including the thickening of the intima. Other interesting and important points mentioned by this investigator are the rapid atrophy of the media in places, and the fact that in the smaller arteries and capillaries the changes were *not* more pronounced than in the larger vessels (23).

Cehanovič has demonstrated experimentally that the above pathological changes occurring in the vessels, cause them to exhibit lack of tone and a delay in pulse wave exactly as are shown in cases at present under discussion (8).

In summing up his review v. Bechterew states that in pathological lesions of nerves there can be seen corresponding bloodvessel changes. These are overgrowth of intima, contracted lumen and blood extravasation into surrounding connective tissue. This simultaneous affection of bloodvessels and nerves results in the important clinical observation that a neuritis can be distinguished by its bloodvessel affection (3).

It may be contended that Lapinski's results are unconvincing, occurring as they did in but 50 per cent. of his cases. But it must be remembered that the ear receives sympathetic fibers by more than one route and there are considerable differences in different animals. In the rabbit most of the fibers for the ear are contained in a bundle which passes to the external carotid artery from the superior cervical ganglion. Following this route the fibers reach the ear by passing alongside the central artery. But others may reach the lower part of the ear by means of an anterior group of sympathetic fibers (22). While not infrequently, in some specimens, a third set reaches the ear from the ganglion stellatum via the ramus vertebralis and the 3d cervical nerve (13).

These alternative routes are quite sufficient to account for the non-appearance of pathological changes in those of Lapinski's cases which at first sight appear to diminish the value of his results.

Again Fraenkel, working on the anterior tibial vessels in cases of tabes, showed that even before the age of twenty years, long before the age at which senile changes begin to appear in the vessels, there were present hypertrophy and hyperplasia of the media, and more or less overgrowth of intima. These changes occurred in association with degenerative changes in the nerves of the lower limb. The same association of pathological changes in nerves and vessels was found to occur in a case of amputation following spontaneous gangrene of the lower limb in an otherwise healthy young man (14).

Fraenkel therefore proceeded to produce experimental evidence of the accuracy of the view that these changes in the bloodvessels were the direct result of lesion to the vascular nerves. He cut the sciatic nerve in rabbits and dogs and obtained the same appearances as he found in chronic nervous disorders such as Tabes, Diabetic Gangrene, and Chronic Alcoholism. These were similar to the results figured in this article. But he also states that in certain instances retrogressive changes occurred especially in the media (15).

Similar results had previously been obtained by Bervoets in two cases of neuritis and experimentally in rabbits (4).

Cyzharz and Helbing repeated the experiments of the previously mentioned workers but did not obtain the vascular changes in all cases. Subsequent to the operation certain rabbits exhibited a trophic change on the dorsum of the foot and in these alone were found the characteristic pathological changes in the vessels. Hence Cyzharz and Helbing concluded that the vascular appearances were secondary to some trophic lesion (9).

In this conclusion they were quite unjustified. For as in the case of the rabbit's ear, an alternative path for vascular nerves to the leg has to be taken into account. It has been shown that in some cases, at any rate, the anterior crural nerve contains vasomotor fibers to the lower extremity (24).

It is the more unfortunate that Cyzharz and Helbing took this view because it has biased later investigators against the truer interpretation of Bervoets and Fraenkel (43). That their criticism was quite groundless is shown by my cases in which the vascular condition appeared *previous* to the trophic lesion (*i. e.*, local gangrene) and was the direct cause of the latter.

It is a curious fact, and one for which there does not seem at present any adequate explanation, that certain vessels only in the arm are affected by this pathological change. It commences in the area supplied by the lowest brachial trunk, and spreads up the larger vessels of the limb, namely the radial, ulnar and brachial arteries, while smaller vessels escape and carry on a collateral circulation. In one case I was able to palpate the superior and inferior profunda arteries, and another vessel on the dorsum of the wrist in the situation of anterior and posterior interosseous arteries (38).

We know that all arteries grow in similar fashion so that vessels such as the radial may be said to represent a stage in the evolution from a minute artery into a large one like the aorta (25).

From the foregoing remarks it is clear that experimental damage to the vascular nerves does initiate pathological changes in the bloodvessels, both arteries and veins, and that these changes are the same as those which characterize the condition so long known as *cervical rib*.

Undoubtedly von Bechterew was right in his assertion that a neuritis can be distinguished by its bloodvessel affection (3).

It is noteworthy that Buzzard in 1902 suggested a vascular causation for the symptoms of cervical rib (5). He pointed out that absence of herpes and papillary symptoms localizes the site of lesion to the portion of nerve between the junction of anterior and posterior roots and its union with the 8th cervical to form the lowest trunk. His view, however, differs from mine in that he suggested the spinal nerve itself to be the seat of localized vascular changes.

It is obvious that knowledge of the interrelation between nervous and vascular changes is of the utmost importance in the correct interpretation of many pathological conditions. For the present, however, we may examine the bearing of this inter-relation to arteriosclerosis and to bloodvessel surgery.

Into such an oft-repeated discussion as the former it would be profitless at this stage to enter deeply, but certain facts may be recalled to mind. Thoma's theories regarding arteriosclerosis in general have stimulated considerable argument. But though it is at variance with some of his views, Thoma himself observed intimal thickening to occur over areas where there was not merely absence of atrophy, but even increase of the middle coat. It has been clearly recognized by many writers (*e. g.*, Jores (19)) that proliferative changes may occur in the intima apart from any inflammatory features. It is also made clear by Klotz that lesions of the intima may be to a large extent independent of changes in the media. This may be observed in vessels from patients before middle age and therefore previous to the occurrence of senile changes (20).

Similar appearances have been observed, as already stated, after experimental damage to large nerve trunks (14) (15) (4).

Although it has been contended that these changes are secondary to trophic lesions (9), it has been shown in this communication that the trophic lesions are the result and not the cause of the vascular changes. Moreover there is no likelihood that the results obtained by Lapinski (23) and by Cehanovič (8) were secondary to trophic lesions such as cutaneous ulcers.

It would therefore be incorrect to conclude that interference with nervous control is insufficient in itself to produce hyperplasia of either intima or media. Klotz is justified in his contention that connective tissue developed in the intima is not necessarily compensatory in nature. And, as Adami observes, sclerotic thickening of the intima is in no sense an inflammatory process (2).

In experimental observations in bloodvessel surgery more attention must be paid to the severance of the vascular nerves than apparently has been the case so far. In simple division and suture of a vessel only a very limited area will be affected. In a circular arterio-venous anastomosis but little more damage may be done to the nerves. Results will depend on whether, in either of the above mentioned types of experiments, the nervous supply of the vessel severed is maintained by fibers passing along the vessel or by fibers reaching it at intervals along its course. In the former case, pathological changes may be expected in the vessel. But if the latter variety of nervous supply obtain, the vessel will show pathological change only in the immediate neighborhood of the experimental lesion. For similar reasons to those just enunciated, incomplete transplantation (where the transplanted segment is not removed from its situation) may or may not result in pathological change in the transplanted segment, according to the type of nerve supply to the segment in question. In complete autoplastic or heteroplastic transplantation, however, the transplanted segment will exhibit pathological changes in time. These will be such as are indicated in the present article, if the vitality is not sufficiently affected to cause death of the transplanted segment. Should the vitality be affected the transplanted portion will react like other dead tissues, being slowly absorbed and replaced by connective tissue.

We are not yet in a position to explain why hypertrophy and hyperplasia should occur in some instances of experimental bloodvessel surgery (12) (43) and why in others there should be atrophy of the smooth muscle of the media (6) (16). It has been indicated by various writers that the height of blood-pressure is a dominant factor in producing these morphological differences (7) (16) (20), but the relation to nerve lesions does not appear to have been fully worked out. In this connection be it remembered that the same diverse results were obtained by Lapinski after severing the cervical sympathetic (23).

It would be invidious to pursue the present theme further in relation to bloodvessel surgery until investigation has been made of the changes occurring in vessel walls in experimental cases of bloodvessel suture and transplantation designed specially to bring into prominence the influence of section of nerves on the results.

Since the above was written a case of vaso-motor disturbance in the vessels of the arm has been recorded by Ibotson, which apparently bears out the view, taken in this article, that nervous lesions are responsible clinically for the manifestation, in many cases, of symptoms of endarteritis obliterans. In Dr. Ibotson's case however the morphological changes cannot have been pronounced as the case ultimately recovered (17).

In conclusion I would express my indebtedness to Mr. J. C. Miller, our departmental librarian and curator, for the willing and competent manner in which he has assisted me in gathering and abstracting the literature of this subject.

Just as this article was ready to go to press there appeared a paper of very great importance by Manouélian (44). The paper describes experiments proving that section of sympathetic nerves to the abdominal aorta and pulmonary artery is followed by localized areas of arteriosclerosis in young dogs. Moreover it shows that considerable damage may be done to the vasa vasorum without resulting arteriosclerotic changes.

SUMMARY

1. The changes in the wall and lumen of bloodvessels which are occasioned by the occurrence of endarteritis obliterans may be dependent for their production on lesion of the nerve supply of the bloodvessel.

2. Such changes in the bloodvessels are not consequent on, but on the other hand are the exciting cause of, trophic lesions of the skin and deeper tissues.

3. These changes occur in some cases of so-called cervical rib and occasion the vasomotor phenomena included in the symptom-complex of that disease.

4. Interference with the trophic nervous supply of blood-

vessels has an important bearing on many questions such as arteriosclerosis and bloodvessel surgery and may account for some of the phenomena discussed under these headings.

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Society Proceedings

THE PHILADELPHIA NEUROLOGICAL SOCIETY

FEBRUARY 28, 1913

The President, DR. GEORGE E. PRICE, in the Chair

Dr. N. S. Yawger presented two cases of tremor, in mother and daughter.

Dr. Charles K. Mills said that these cases came to the neurological clinic while he was still on duty and seemed to be of interest simply because of their obscurity of etiology and nature. Dr. Mills thought at one time they might be connected with some thyroidal or pituitary change. They have the appearances of a toxic tremor which, of course, is a very broad diagnosis. Whether coffee has had anything to do with it is doubtful. However that is the only cause which has been assigned or appears to have been present.

Dr. W. G. Spiller said he thought that the tremor in these cases might be caused by coffee, as both mother and daughter had used much coffee. He knew three physicians who had tremor after drinking coffee. There probably is some predisposition to coffee intoxication in certain persons.

Dr. F. X. Dercum said that he did not think the cases presented by Dr. Yawger could be regarded as instances of hereditary tremor. Tremor does occur in families. It seemed to be an isolated symptom here. Coffee drinking is practised in Germany, but still we do not see much tremor from coffee. No doubt coffee does at times produce tremor, but he would hesitate to ascribe those cases to coffee.

Dr. Charles K. Mills made some remarks on a form of subchronic periostitis and its complications developing at the origin and insertion of over-used muscles.

Dr. W. G. Spiller said he had had good results in treating these conditions by fixation of the painful part in a plaster cast. In one case he had a plaster cast placed about the foot. This treatment had been useful in sciatica. A plaster cast about the hip, fixing the thigh so that it could not be flexed, had been curative in sciatica. He did not imply that Dr. Mills' cases were those of sciatica.

Dr. Mills said while he had been very much interested in what Dr. Spiller said about the fixation treatment in sciatica, of course the cases to which he alluded were not cases of sciatica, sciatic neuritis. The sciatic nerve was very carefully examined and sciatica was excluded. They were cases in which the pain was distinctly referred to the points where the tug of the muscle and tendon took place. They could perhaps be described as cases of musculo-periosteal fibrositis, certainly not as cases of sciatic neuritis.

Dr. Charles W. Burr said that three in this generation, of whom two had been under his care at The Orthopedic Hospital and Infirmary for Nervous Diseases, had stiff gait, spastic knee jerks, Babinski jerks, ankle clonus, without involvement of the bladder or rectum, without any sensory disturbance and without any symptom of any kind above the waist. One aunt was alleged to have walked stiffly and to still present the same symptoms. In this boy it apparently followed an attack of enteric fever. In the other boy it came on without any apparent cause. The diabetes came on after the cord disease was established. Strümpell was the first, Dr. Burr thought, who reported cases occurring in families and after him Erb described the condition more fully than anyone else.

Dr. T. Turner Thomas presented cases of brachial palsy in children and adults.

Dr. J. Hendrie Lloyd said he had had an opportunity of seeing Dr. Thomas operate on two patients whom he had referred to him at the Philadelphia Hospital. They were both bad traumatic cases, almost complete brachial paralysis, and in both these cases Dr. Thomas got very good results by his method of abduction, somewhat as he has shown it here tonight. Dr. Lloyd said he had no theory to propound in regard to this method in these cases. He doubted whether any one theory would cover all cases of brachial paralysis. He thought in the traumatic cases which Dr. Thomas operated on at the Philadelphia Hospital the secret of success somehow consisted in taking off weight and pressure from the injured nerve trunks. In such cases the arm hangs lifeless, dragging on the nerve trunks and probably by mere weight making pressure on them against the chest wall. The method of abduction and support as shown by Dr. Thomas relieves that weight and pressure to a certain extent. There is another class of cases of brachial paralysis, however, which is interesting to the neurologist, but which is really not traumatic. They are cases in which there is a fibrous anchylosis of the shoulder-joint with some involvement of the brachial nerve trunks. Dr. Lloyd said he saw recently a woman who had involvement of the nerves along with fibrous anchylosis of the shoulder. He had seen a number of such cases. It is a question which is the primary lesion, whether the joint lesion is first or the nerve lesion. He said that these patients would never get well unless the fibrous anchylosis were broken up. They are not traumatic and hardly fall into the same class as Dr. Thomas's cases.

In cases of infantile paralysis the pathology, of course, is different. But in these cases, also, the relief of weight and pressure by such an apparatus as Dr. Thomas has shown may put the arm in a more advantageous position for recovery.

Dr. S. Leopold said that the value of Dr. Thomas's operation in partial sublunation was well known, but that he did not see the value in the two cases presented. The cases seemed to be acute anterior poliomyelitis. It is a well-known fact that return of motion may occur very late, depending upon the degree of destruction of the cells in the anterior horn of the spinal cord. It did not seem possible that lightening of the capsule of the shoulder joint could exert an influence on these damaged cells. In the other case presented, that of the young woman, while it was difficult to give a snap diagnosis, it seemed strange to him that a sudden slight snap could produce such a complete paralysis and the case impressed him more as a functional than as a true organic neuritis.

Dr. J. W. McConnell said the cases shown were presented at the University Dispensary for nervous diseases. Dr. McConnell examined both of them and made the diagnosis that they were both cases of anterior poliomyelitis. In the boy, the Italian, there was very little power in the arm. The electrical reactions showed that power was normal in the trapezius and there was some reaction in the flexors of the hand and fingers. They were the only reactions he could obtain. That was previous to the operation. In talking the matter over with Dr. Thomas he suggested the operation in hope of putting the whole limb in a more nearly normal condition, so that if there were any possible chance of relieving weight on the paralyzed muscles that might still have some life in them, there might be some return of power in them. Dr. McConnell thought that was the condition which had occurred in Dr. Thomas's cases. He did not suppose for a moment there had been any effect on degenerated anterior horn cells. He believed some nerve fibers had escaped, but with the weight of the limb there was no chance for recovery of power. Therefore operation was done and the cases show with what results. In reference to Dr. Leopold's remark concerning a slight accident producing such serious consequences in the case of the young woman presented by Dr. Thomas: Dr. McConnell related a case that occurred in his own practice in the last five weeks, a slight accident that took place in a man. He came into Dr. McConnell's office, having slipped on the stair of the elevated station. He struck his hand in trying to catch himself. He was conscious of pain in the shoulders and the muscles of the upper extremity were completely paralyzed. He presented himself to Dr. McConnell fifteen minutes after the accident. Dr. McConnell examined the shoulder; there was no no dislocation; on extreme posterior rotation the man had considerable pain on the posterior portion of the humerus. At the same time Dr. McConnell was able to elicit a little crepitus. He fixed the man's arm in a sling and told him to go home, and the next morning sent him to the X-ray laboratory at the University and a scaling off of the greater tuberosity was found. By fixing his limb and slinging it in the way Dr. Thomas suggested to Dr. McConnell the man made a very good recovery. Dr. McConnell kept a splint on for two weeks and then commenced the form of exercise, that of climbing up the wall until he got complete abduction of the arm. The man has complete return of function, no pain whatsoever and no loss of tissue. It seemed to him that many of the cases which were formerly regarded as circumflex paralysis where the patient fell, may have been from striking the shoulder, Many of the cases may have been blood extravasation with the capsule.

Dr. W. G. Spiller said that Dr. McConnell's case reminded him of a case he had reported a year ago before the Neurological Society. A man in attempting to throw a heavy valise on the platform of a railroad car felt something snap. An X-ray plate showed that there had been a splitting off of the great tuberosity of the humerus.

Dr. Thomas, in closing, said that Dr. Lloyd referred to cases of brachial paralysis in which there was fibrous ankylosis of the shoulder, which he inferred was of non-traumatic origin. He has seen similar cases and is satisfied that the condition is common to all inflammations of the shoulder joint, traumatic and infectious, but in these with ankylosis there is not a flail joint, of course. With an inflamed shoulder joint the arm rests in the position of greatest ease, *i. e.*, in adduction and internal rotation, with resulting thickening and contraction of the relaxed or axillary portion of the capsule. The inflammatory material by gravity may involve the axillary nerves. He saw one case at the Philadelphia Hospital with both shoulder joints involved, and the paralysis so marked as to lead to the diagnosis of chronic anterior poliomyelitis, and yet with the restoration of motion in the two joints there was a remarkable restoration of power, quite sufficient to exclude a poliomyelitis. Dr. Leopold asks why these operations were done. This would make rather a long story, and yet Dr. Thomas feels the responsibility for having undertaken the operations sufficiently to wish to offer a brief answer to the question. His first case was one of a rather severe brachial palsy associated with fibrous ankylosis of the shoulder, and the patient had not been able to work for more than a year. He had consulted many physicians and had been advised uniformly to let the condition alone. Dr. Thomas became imbued with the idea that the ankylosis of the shoulder had something to do with the palsy, although he did not know what the connection was, and with the patient under ether he broke up the limitation of movement and dressed the limb in full abduction for twenty-four hours. It was then brought to the side, the patient sent home and advised to force it up into full abduction twice a day. The power returned sufficiently to permit the patient to return to his former occupation in two months and when he was seen again a year later no difference in power or motion could be detected between the two arms. This result set Dr. Thomas to thinking and he later obtained similar results at the Philadelphia Hospital. Then he found a case on Dr. DaCosta's service with a severe brachial paralysis and a flail shoulder joint. He again became imbued with the idea that the real trouble was in the shoulder joint, since it followed an accident to the shoulder, and the patient localized his trouble in the shoulder joint. Dr. Thomas felt that if he could get into the joint he could locate the trouble and probably correct it. Dr. DaCosta gave him permission to try. When Dr. Thomas got into the shoulder joint, he was much disturbed because he found nothing to account for the condition except that the upper part of the capsule was too long. He decided to shorten this portion of the capsule and the overlying rotator muscles. The patient was shown before this society two years ago. In about three months the patient stated that the limp was as good as it ever had been, although there was still some atrophy of the posterior scapular muscles. He has now operated on four such cases in adults and four cases in children with flail shoulder joint, and has never had infection, and the results have been very encouraging. Dr. McConnell's case and Dr. Spiller's case, of fracture of the greater tuberosity, interested him very much. He has gone into that phase of the subject in a paper which will be published in a few months. He believes that the cause in practically all these cases is the same, forced abduction, usually from a fall on the hand. At the moment of impact the arm is rigid at the elbow and is carried into abduction at the shoulder. The lesion will vary according to the degree of force applied. The first effect is to tear the axillary portion of the capsule and if the force is continued the outer surface of the surgical neck of the humerus strikes against the edge of the acromion and the head is pried out of the socket. At this point the upper part of the capsule and rotator muscles attached to the greater tuberosity are put under tension, and if the force is great enough are torn loose with or without taking away a piece of the tuberosity. The limitation of movement in these cases is the result not of the fracture of the tuberosity so much as of the extensive axillary tear of the capsule which permitted the dislocation and fracture. When the arm falls to the side of the body after the force has spent itself the head may jump back into the socket or remain dislocated.

Dr. Williams B. Cadwalader presented a case of tabes with muscular atrophy.

Dr. George E. Price said that some two or three years ago in the out-patient department of the Jefferson Hospital there was a patient with typical symptoms of tabes, including a Charcot joint of the right ankle. The man also had a muscular atrophy of spinal type affecting the muscles of the shoulder girdle and the hands. Dr. Price then exhibited some photographs of the case taken by Dr. Burns.

Dr Sherborne W. Dougherty and Dr. John B. Roberts reported a case of brain tumor perforating the cranium and also involving the longitudinal sinus.

Dr. J. Hendrie Lloyd said he had had an opportunity of studying this case in the service of Dr. Dougherty at the Methodist Hospital. The point of special interest in it was the fact that the tumor involved the superior longitudinal sinus and also perforated the skull. At the bedside the case seemed to him to be a very simple one, and he had no hesitation in advising and even urging operation. It never occurred to him at the time that there would be any particular danger in the operation. There was some evidence of pressure. The man had choked disks, but he had no other evidence of involvement of the brain, excepting the intense pain. The X-ray picture showed the punched-out hole through the cranium as clean as if made by an auger. At the operation the wounding of the longitudinal sinus was inevitable. The tumor grew from the membranes directly over the longitudinal sinus and endeavoring with all due care to dissect it off Dr. Roberts was unfortunate enough to have his knife slip into the wall of the sinus and he had an alarming and uncontrollable hemorrhage. Clamping and packing the sinus acted as a sort of thrombosis. The patient had only 3 ounces of ether, and although he never regained consciousness, there was no possibility of laying the blame to the ether. Dr. Lloyd thought the fatal result was entirely due to the necessarily imperative procedure of obstructing the longitudinal sinus.

Dr. John B. Roberts said that he thought the man did not die of thrombosis of the sphenoidal sinus. We ought to know exactly what did happen. Separating the two hemispheres to get control of the bleeding sinus in the upper margin of the falx, he was inclined to think, caused some laceration of the corpus callosum. That combined with his plugging the wound under the skull opening with perhaps one square inch of gauze was probably the cause of the fatal issue. It was not thrombosis, although Dr. Lloyd put some stress on that possibility. The longitudinal sinus was not cut by the slip of the knife. It was intentionally divided in removing what was believed to be a malignant tumor. It bled because he did not get the artery clamp on so as to entirely control bleeding, and the subsequent manipulations caused laceration and compression of the brain. The bleeding was controlled, but the tissues were damaged, notwithstanding the second opening in the skull behind the wound, which was made for removing the tumor. He had recognized the danger point and thought that he had a technic, which would meet the requirements; but he was mistaken.

Dr. F. X. Dercum presented a paper on "a case of hypochondriasis with remarks on the affection."

Dr. S. Leopold said he had seen two cases of this character in one day and this type of mental condition was an extremely interesting one. There were two ideas—what does the element of fear play in this condition. And what is the origin of this fear. To Dr. Leopold's mind, if we can get at either the organic or the psychic basis of origin of fear we have the explanation of this class of cases.

Dr. S. F. Gilpin presented a case of astasia abasia.

NEW YORK NEUROLOGICAL SOCIETY

April 1, 1913

The President, Dr. Smith Ely Jelliffe, in the Chair

A CASE OF SYPHILITIC OSTEITIS AND PERIOSTEITIS OF THE SKULL

By M. S. Gregory, M.D., and M. J. Karpas, M.D.

The patient was a German woman, married, 45 years old. She was temperate and gave no history of syphilis or of sinus or aural affection. The family history was negative. The patient enjoyed good health in infancy and childhood, and was married when she was fifteen years and four months old. She had four children; two of these died, one at the age of three of cholera and the other at the age of seven months of jaundice. There was no history of miscarriages, and no direct or indirect history of syphilis could be determined. The Wassermann test in the husband was negative. The patient ceased to menstruate at the age of 44, and had been sterile for the past 27 years. It was stated that after the birth of each child she would become very obese. There was no history of trauma.

The patient enjoyed excellent health until seven years ago, when she was operated on for gall stones, and three and a half years later she had an attack of malaria. In July, 1909, she complained of pain and swelling in the left knee and right thigh. She began to have difficulty in walking, and was put to bed. Occasionally, small soft growths would appear on the scalp, which would disappear without treatment. For more than ten years she had suffered from terrific headaches, which persisted all the time. In March, 1911, she lost her hearing in the left ear, and about the same time the left side of the face became paralyzed. No definite date could be fixed for the paralysis of the left external rectus. During this time the patient had received active anti-luetic treatment, including mercury, potassium iodide and salvarsan. On March 31, 1912, she had a convulsion which was limited to the face and upper extremities, and it was then noticed that the left eyeball became bulging and that the sclera was congested, but the cornea was unaffected. On the following day she had a similar convulsion, after which she became drowsy and fell asleep, and when she awoke she was delirious, spoke in a rambling manner, said that she saw cats, etc., and her general behavior was irrational.

The patient was admitted to the Psychopathic Department of Bellevue Hospital on April 1, 1912, in a delirious and excited state, which subsided in a few days. During her stay in the hospital, repeated neurologic and somatic examinations were made, of which the following is a brief summary: The patient was poorly nourished and cachectic, with a flabby musculature and dry skin. She was somewhat anemic, and her general physical condition was very poor. She was a bed-ridden invalid, requiring constant care and attention. The heart's action was weak and irregular; there was some evidence of chronic nephritis and of a tuberculous process at the left apex. The arteries were not thickened.

Neurologic status: Smell was apparently intact; exophthalmus, especially of the left eye; purulent keratitis of the left cornea; the left pupil was covered by a purulent film, and for that reason its motivity could not be determined. The right pupil reacted to light and accommodation, and the sympathetic reflex was intact. There was no evidence of paralysis of the ocular muscles excepting the left external rectus. The optic discs were normal. There was a posterior stypholoma. The left corneal and conjunctival reflexes were abolished, but the touch sense was not affected. The left side of the face was paralyzed; the mouth was drawn to the right, the naso-labial fold was obliterated and the tongue deviated to the right. Hearing on the right side was good; that on the left was poor. The other cranial nerves showed no pathological condition. There were no sensory disturbances nor evidences of pyramidal irritation. The reflexes of the upper and lower extremities were active; the abdominal reflexes were absent. The patient was unable to assume a sitting or a standing posture, and she could not walk. There was some difficulty with coördination on the left side. The spinal centers were not under control.

The Wassermann test in the blood was negative. The cerebrospinal fluid showed no increase of globulin nor complement-deviation: there were only 10 lymphocytes per cm.

When the patient was admitted to the hospital she was confused, restless, and complained of terrific pains in the head and left eye, which at times were so intense that she cried loudly and showed considerable agitation. She had several convulsions, which were usually general; some were severe; others mild. She spoke in a rambling manner, claiming that she saw animals, etc. Her speech was often unintelligible and her answers irrelevant. She was depressed and agitated, but after a few days she became quiet and composed and was able to give a fairly good account of herself. She was clearly oriented, maintained that she was sick, complained of terrific headaches and showed a very good insight into her physical disorder. Her general mental condition showed but little variation: only when her headaches were very marked she would become restless and agitated, and on several occasions she was somewhat delirious and hysterical. Shortly before her death, which occurred on May 16, 1912, she became very delirious, spoke unintelligibly, had hallucinations and was irrelevant in her replies.

Dr. Morton E. Hall, pathologist to Bellevue Hospital, gave a detailed report of the pathological-anatomical findings in the case reported by Drs. Gregory and Karpas. The autopsy in this case was performed by Dr. Charles Norris, and the anatomical diagnosis was as follows: Chronic periosteitis and osteitis of the frontal, parietal and occipital bones and the petrous portion of the left temporal bone (syphilitic). Chronic pachymeningitis of the left middle fossa. Chronic mastoiditis and otitis media (syphilitic). Lobar pneumonia. Chronic cellulitis of the tissues of the scalp (syphilitic). Chronic interstitial hepatitis (syphilitic). Anemia. The anatomical diagnosis was confirmed by the pathological findings. In this and in a second similar case that had come under Dr. Hall's observation it was interesting to note the worm-eaten type of osteitis, and both cases showed marked suppurative changes, with elevation of the periosteum. There were no evidences of cerebral infiltration, and the spirochæta was not definitely demonstrated in either case. [The history of this case will appear in full in the Journal.]

AN ANOMALOUS CASE OF ACROMEGALY

By Edward D. Fisher, M.D.

Dr. M. Neustaedter presented this case for Dr. Fisher. The patient was a Russian, 30 years old, a peddler, whose family history was unimportant with the exception that he had one brother who was suffering from multiple sclerosis. The patient was married, but his wife had never been pregnant. Up to a year ago, he was slightly alcoholic. Eight years ago he had gonorrhea; denied lues.

Four years ago he began to have trouble with his eyesight, which constantly grew weaker. Three months ago he began to suffer from headache which was constant up to a week ago. He had never vomited nor suffered from nausea. About ten weeks ago his speech became affected, and at the present time he also complained of "drawing" pains in his limbs, especially in the left leg. He became depressed and began to lose his memory, especially as to recent events. He was always sleepy and rather irritable. His gait, which was formerly slightly ataxic, was now fairly good. He was constantly gaining in weight in spite of his poor appetite and had gained fifteen pounds in three months.

Physically, he was well nourished. There seemed to be a beginning deposit of adipose tissue around the hips. His hair, as compared with a photograph taken three years ago, was becoming rather sparse and coarse, and this was also true of the hair in the genital and axillary regions. The skin was thick and moist. The lower jaw was becoming enlarged, as shown by the x-ray of Dr. L. T. Le Wald, and the bones of the fingers were becoming thickened. The sella turcica was slightly enlarged and about 5 mm. in diameter. His speech was rough and deeper than formerly; it was protracted and at times even rambling. His movements were rather clumsy, lacking energy, and he complained of sleepiness. His hearing was not affected. There was a marked impairment in his sense of taste on the left side of the posterior two thirds of the tongue. Smell was much impaired on the right side. There was evident exophthalmus; the pupils were dilated, irregular in shape and unequal, the right being the larger. They failed to respond to light or accommodation. There was a left staphyloma and a double choroiditis. The patient also presented a binasal hemianopsia, a myopia of seven diopters, a haziness of the vitreous and detached retinæ on the temporal side of both eyes. There was a fine intention tremor of the hands and tongue. The superficial reflexes were present and lively; the knee jerks were exaggerated; there was no Babinski nor clonus. The motor power of the flexors of the left arm and leg was somewhat diminished. The Wassermann reaction was very strongly positive.

Dr. Edward D. Fisher said that while this was not a well-defined case of acromegaly, the x-ray findings pointed rather strongly to that diagnosis. The enlargement of the sella turcica, as shown by the x-ray, was rather peculiar, and differed from what we would expect to get in a tumor of the pituitary body. It showed, however, as the eye findings would indicate, the presence of a growth in that region, which spread beyond the sella turcica and probably involved the chiasm. The general characteristics of the case pointed to a tumor of the pituitary body. The man had improved somewhat under large doses of potassium iodide. In its present stage, the case was a questionable one of acromegaly. If the symptoms, particularly the loss of sight and the mental condition, became more pronounced, the advisability of an operation might be seriously considered.

Dr. William M. Leszynsky said it was rather unusual to have a binasal hemianopsia with a lesion of the pituitary body: a bitemporal hemianopsia was the usual condition found. To produce the former, a lesion involving the external fasciculus of each optic tract was necessary.

JUVENILE PARESIS

By Smith Ely Jelliffe, M.D.

A girl, fifteen years old, whose birth was apparently normal and developed normally as far as walking and talking were concerned. Her parents stated she had always been backward in reading. About four years ago she began to have pains and stiffness in the legs, and attacks which were called " fits," during which she would become rigid but did not lose consciousness. About this time there was an apparent retrogression in her mental development, and since then she had slowly deteriorated. Neurologically, she showed Argyll-Robertson pupil, a tremor of the tongue and face, an infantile mode of speech, with a degree of hesitation that almost amounted to stuttering, and a loss of knee jerks. These symptoms, briefly stated, had led Dr. Jelliffe to regard the case as one of paresis of the juvenile type. The girl's father died at the age of 42 after a maniacal attack, and was a paretic. The mother has Argyll-Robertson pupils. The patient had Hutchinson's teeth. A further exposition is promised.

Dr. B. Sachs said he had a distinct impression that juvenile paresis was an extreme rarity. In the case shown by Dr. Jelliffe there was possibly a congenital syphilitic condition, and consequent mental deterioration. The findings, as given by Dr. Jelliffe, were not sufficiently definite to base the diagnosis of juvenile paresis upon them. The child's speech did not strike him as paretic in character, and the speaker said he would be inclined, in a case of this kind, first of all to try the effect of energetic anti-syphilitic treatment and see whether her condition would not be improved thereby.

Later study of the blood and cerebrospinal fluid showed positive 4 reactions. (J.)

VIRCHOW-ROBIN LYMPH SPACES IN PARESIS

By Smith Ely Jelliffe, M.D.

Dr. Jelliffe showed some illustrations of the findings that Achucarro and Snessarew had reported relative to the development of new connective tissue about the perivascular and Virchow-Robin lymph spaces in paresis. They indicate that these lymph spaces become completely organized, so that in the brain of the paretic a very grave alteration in the lymphatic circulation must result. Just at what stage of the disease this infiltration takes place; just how extensive it is and just when it reaches its maximum have not yet been definitely determined.

These connective tissue changes in the brain, Dr. Jelliffe said, probably had an important bearing upon the difficulty encountered in the successful treatment of paresis. We were aware of the difficulty with which antisyphilitic remedies penetrated or circulated within the brain tissue, which would indicate that grave metabolic disturbances were brought about by the inability of the lymphatic circulation to carry on its function. At the last meeting of the Society, Dr. Moore demonstrated the presence of the *Treponema pallidum* in the brain and showed that this organism lay at a considerable distance from the blood vessels and the lymphatic channels. The problem of therapy, therefore, is not only that of the inaccessible spirochæte, but also of the blocked lymph-spaces. This latter fact is possibly largely responsible for the diffuse and uniform parenchymatous degeneration which is so manifest in paresis, in contrast with the vascular localized disturbances of other types of cerebrospinal syphilis.

THE DIRECT TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

By Homer Swift, M.D., and A. Ellis, M.D.

Syphilis of the central nervous system is one of the most important manifestations of a chronic infectious disease. The discovery of the *Treponema pallidum* in general paralysis by Noguchi and Moore has enabled us to properly classify this condition, so that parasyphilis today must be regarded as active syphilis of the central nervous system. If, in any disease, we have an etiologic agent present and still active, and if we have specific therapeutic agents to use against the microörganism, it seems rational to apply the drugs until all evidence of activity of the virus is removed.

Syphilis of the central nervous system is one of the most resistant forms of the disease to treatment. The symptoms are often mechanical, and improve or disappear when treatment is applied, but the entire eradication of the disease is most difficult. These difficulties are increased by the anatomical peculiarities of the central nervous system. The perineuronal lymph spaces and the perivascular lymphatics are the sites of the most intense round-cell infiltration. These spaces are directly connected with the subarachnoid space. Drugs and antibodies are but little eliminated into the cerebrospinal fluid, so that treatment intravenously only reaches the disease on the side of the blood stream. Attempts to introduce salvarsan by means of lumbar puncture have resulted in intense irritation of the meninges in monkeys. Serum is practically the only substance known which it is safe to repeatedly introduce into the subarachnoid space.

It has been shown that the serum of patients who have been treated with salvarsan has definite effect upon spirochætal diseases: (*a*) clinically on congenital and secondary syphilis, (*b*) by inhibiting the growth of *Treponema pallidum* in cultures, (*c*) by inhibiting the growth of spirochæte of relapsing fever in mice, and (*d*) clinically in central nervous syphilis by introducing serum directly into the subarachnoid space.

The technique that we have employed is to treat the patient intravenously with salvarsan or neosalvarsan, one hour later withdraw 40 to 50 c.c. of blood into a sterile centrifuge tube, centrifugalize the blood, and separate the serum from the clot. 12 c.c. of the serum is diluted with 18 c.c. of normal serum and heated to 56° C. for one half hour. A lumbar puncture is made and spinal fluid withdrawn until the pressure is reduced to 30 mm. of cerebrospinal fluid. The forty per cent. serum is then injected by gravity through the lumbar puncture needle.

The following lantern slides were shown: First, reduction in the cell count, globulin and Wassermann reaction in the spinal fluid in patients who had received intravenous treatment. These patients were then treated with combined intravenous and intraspinous treatment and the cerebrospinal fluid brought to normal. Three slides were then shown of patients who had received intraspinous treatment alone and whose cerebrospinal fluids were brought to normal. Several slides were shown of patients with combined intravenous and intraspinous treatment, where the therapeutic effect was most marked. It was emphasized that the intraspinous treatment was not introduced as a substitute for other forms of treatment, but as an additional form of treatment to apply in those cases of cerebrospinal syphilis, tabes, and perhaps general paralysis, where the intravenous treatment alone was not sufficient or where a rapid therapeutic effect was desired.

Professor K. Heilbronner, of the University of Utrecht, who was invited by the President to open the discussion on the paper of Drs. Swift and Ellis, said he could only thank the Society for the privilege of being present, and of having had the opportunity of listening to this very interesting presentation of the subject of treating cerebrospinal syphilis by a new and direct method.

Dr. John A. Fordyce (by invitation) said that while he felt a certain amount of hesitation in discussing the treatment of syphilis of the nervous system before neurologists yet his experience with these manifestations of the disease from the standpoint of a syphilographer might prove of some value. He wished to say at the outset that he had had no experience with the intraspinous method of treatment as described in the paper by Dr. Swift and Dr. Ellis but he had had during the past two and one half years considerable experience with salvarsan given intravenously in syphilis of the cerebrospinal system. Although many of the nervous manifestations of syphilis occur several years after infection, in the great majority of cases, if not in all, involvement of the cerebrospinal system took place during the secondary stage of the disease. It was at this time that there was a generalized dissemination of the spirochætæ. Dreyfus has demonstrated that during this stage more than 50 per cent. of cases of syphilis showed some evidence of involvement of the cerebrospinal fluid frequently without giving rise to symptoms. It was reasonable to assume, therefore, that the infecting agent might remain latent in the cerebrospinal fluid for years but under the influence of various contributing factors it could cause during this stage or later meningitis, paresis or the complicated clinical picture of cerebrospinal syphilis. From the histories of patients who came under his observation with tabes or other forms of cerebrospinal syphilis he was impressed with the frequency with which these patients stated that they had had months or years before ocular paralysis or other manifestations of meningitis. During the early experiments with salvarsan as a therapeutic agent Dr. Fordyce said it was thought that one or two doses of the remedy would be sufficient to control the infection and unfortunately this impression was still held by many practitioners and fostered the belief that salvarsan was not effective in the treatment of syphilitic conditions of the cerebrospinal system. As a matter of fact we now know that many of these cases were aggravated by one or two doses while on the other hand many of their symptoms were relieved by the persistent use of the drug. It was a common experience with him to see an aggravation of the tabetic symptoms produced by one or two doses of the drug but by persistence in its administration the pains, crises, bladder symptoms and general nutrition of the patients were often greatly benefited. The speaker said that his own plan of treatment in these cases was to give injections of salvarsan at weekly intervals combining them with mercury at intervals of three or four days. In one case he gave 21 injections of salvarsan, about 10 grains in all, with marked alleviation of the symptoms in a patient who had come to him with the diagnosis of paresis. The Wassermann reaction in this case had not been influenced by the treatment and his cerebrospinal fluid at the last examination contained 90 cells with a positive Wassermann and globulin reaction. He was inclined to believe in this case that the intraspinous method of Dr. Swift might prove of distinct benefit. Dr. Fordyce said that he was becoming more and more convinced that salvarsan had no deleterious effect on the optic nerve. On the contrary he now had two cases under his observation where it had proved distinctly beneficial. In one of these cases the visual fields had enlarged and whereas before the treatment the patient could not count fingers before one eye she can now distinctly recognize features with this eye. In closing his remarks he again emphasized the importance of persistent treatment with salvarsan and mercury if we wish to permanently benefit these cases and influence the pathological changes in cerebrospinal fluid.

Dr. Sachs said he had listened with much interest to the paper of Drs. Swift and Ellis, and that he, with others, would hail with great satisfaction any method that would render the treatment of syphilitic diseases of the cerebrospinal system more successful than it had been heretofore. The theory upon which this method of treatment was based was surely a plausible one, and appeared to exert a direct effect on the syphilitic process in the central nervous system. Whether the change in the globulin content and cell count necessarily indicated an improvement in the patient's condition would have to be determined by a much longer experience with this method of treatment, and the results would be watched with great interest by clinicians.

Dr. Sachs said that in the treatment of syphilis of the central nervous system with salvarsan, he had been struck by several points. One was that the persistence of the Wassermann reaction, both in the blood and spinal fluid, seemed to be out of relation to the intensity of the morbid process. While he was glad to have the assurance of Dr. Fordyce that we had given the salvarsan altogether too infrequently and in too small dosage, still a word of caution was in order, lest we should go from one extreme to the other. Women, apparently, did not tolerate as large a dose as men.

Dr. Fisher said that in the early days of salvarsan he was opposed to its use in general paresis and tabes: upon the strength of more recent reports, however, he had employed it in parasyphilitic conditions to a considerable extent, and in no instance could the results be regarded as marvelous. In certain cases, of course, we could not expect it to do more than to relieve the pains and possibly some of the ocular symptoms. He had found it more effective in those cases which we had clinically designated as cerebrospinal syphilis, in which the pathological changes differed from those of general paresis or tabes, although the differential diagnosis was often obscure.

Dr. D. M. Kaplan said that in the tables shown by Dr. Swift one could observe that in the majority of the cases the cell content became normal much sooner than the positive Wassermann disappeared. In the majority of cases, the condition was improved in spite of the fact that the Wassermann remained positive. We had come to regard a positive Wassermann as an indication of a still existing syphilis, and until it became negative we could not look upon it as a cure or even an amelioration. It seemed to him, the speaker said, that the use of a large quantity of spinal fluid tended to make the positive Wassermann a persistent factor, regardless of the fact that the other serological tests became negative.

Dr. I. Strauss asked Dr. Swift whether the results of this treatment, as shown by the tests of the cerebrospinal fluid, had been compared with those in cases that had been treated only with salvarsan. Also, whether any improvement in the objective signs had been observed following this method of treatment, or whether they only improved subjectively. We knew that tabetics were very apt to be helped by any new method of treatment. Also, whether Dr. Swift had had any cases that showed toxicity due to the continuous use of the salvarsan, and if so, how long he would wait in such a case before repeating the dose?

Dr. Swift, in closing, in reply to Dr. Sachs, stated that the warnings of Ehrlich had been heeded, and the dose of salvarsan had been reduced in treating women. The dose for women was usually one tenth of a gram less than that for men.

In carrying out the direct treatment, Dr. Swift stated that the patients usually received five or six injections at intervals of two weeks. If intravenous treatment alone was given, weekly injections were used.

In those cases where, as the result of treatment, the cerebrospinal fluid had been reduced to normal with a negative Wassermann reaction, there had been no further progression of the tabetic symptoms. From this we might expect that if these patients had been treated in a sufficiently early stage, there would have been hope of permanently arresting the disease at that time.

In answer to Dr. Strauss the speaker said they had not seen much improvement in the objective symptoms in their cases, and he knew of no instance where the knee jerks returned once they were gone.

THE NEWER HISTOPATHOLOGY OF THE CORTEX IN THE PSYCHOSES

By H. A. Cotton, M.D., of Trenton, N. J.

Dr. Cotton made some remarks on this subject, which he illustrated with the aid of colored lantern slides. He emphasized the fact that there was a general feeling that there had not been much encouragement in the study of the histopathology of the cortex in the psychoses. This he thought was a false impression. Much had been done in paresis, and the recent discoveries of Noguchi and Moore showed the necessity for persistence in the work in connection with other diseases, such as dementia præcox, to which his own pathological studies had been largely limited.

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

of Vienna

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(*Continued from p. 406*)

Romulus

King Proca bequeaths the royal dignity to his first born son Numitor. But his *younger brother, Amulius, pushes him from the throne,* and becomes king himself. So that no scion from Numitor's family may arise, as the avenger, he kills the male descendants of his brother. *Rea Silvia, the daughter, he elects as a vestal, and thus deprives her of the hope of progeny, through perpetual virginity* as enjoined upon her under the semblance of a most honorable distinction. But the vestal maiden was overcome by violence, and having *brought forth twins,* she named *Mars* as the *father of her illegitimate offspring,* be it from conviction, or because a god appeared more creditable to her as the perpetrator of the crime.

The narrative of the exposure in the Tiber goes on as follows: The saga relates that the floating tub, in which the boys had been exposed, was left on dry land by the receding waters, and that a thirsty wolf, attracted from the neighbouring mountains by the children's cries, offered them her teats. The boys are said to have been found by the chief royal herder, supposedly named Faustulus, who took them to the homestead of his wife, Larentia, where they were raised. Some believe that Larentia was called Lupa, a she-wolf, by the herders, because she offered her body, and that this was the origin of the wonderful saga.

Grown to manhood, the youths Romulus and Remus protect the herds against the attacks of wild animals and robbers. One day Remus is taken prisoner by the robbers, who accuse him of having stolen Numitor's flocks. But Numitor, to whom he is surrendered for punishment, was touched by his tender age, and when he learned of the twin brothers, he suspected that they might be his exposed grandsons. While he was anxiously pondering the resemblance with the features of his daughter, and the boy's age as corresponding to the time of the exposure, Faustulus arrived with Romulus, and a conspiracy was hatched, when the descent of the boys had been learned from the herders. The youths armed themselves for vengeance, while Numitor took up weapons to defend his claim to the throne he had usurped. After *Amulius had been assassinated,* Numitor was re-instituted as the ruler, and the youths resolved to found a city in the region where they had been exposed and brought up. A furious dispute arose upon the question which brother was to be the ruler of the newly erected city, for neither twin was favored by the right of primogeniture, and the outcome of the bird oracle was equally doubtful. The saga relates that Remus jumped over the new well, to deride his twin, and *Romulus became so much enraged that he slew his brother.* Romulus then usurped the sole mastery, and the city was named Rome after him.

The Roman tale of Romulus and Remus has a close counterpart in the Greek myth of a city foundation by the twin brothers Amphion and Zethos, who were the first to found the site of Thebes of the Seven Gates. The enormous rocks which Zethos brought from the mountains were joined by the music drawn from Amphion's lute strings to form the walls which became so famous later on. Amphion and Zethos passed as *the children of Zeus and Antiope,* daughter of King Nykteus. She escaped by flight from the punishment of her father, who died of grief; on his death bed he implored *his brother and successor on the throne, Lykos,* to punish the wrongdoing of Antiope. Meantime she had married Epopeus, the king of Likyon, who was killed by Lykos. Antiope was led away by him in fetters. She gave birth to twin sons in the Kithaizon, where she left them. A shepherd raised the boys and called them Amphion and Zethos. Later on, Antiope succeeded in escaping from the torments of Lykos and his wife, *Dirke.* She accidentally sought shelter in the Kithaizon, with the twin brothers, now grown up. The shepherd reveals to the youths the fact that Antiope is their mother. Thereupon the cruelly kill Dirke, and deprive Lykos of the rulership.

The remaining twin sagas,[45] which are extremely numerous, cannot be discussed in detail in this connection. Possibly they represent a complication of the birth myth by another very ancient and widely distributed myth complex, that of the hostile brothers, the detailed discussion of which belongs elsewhere. The apparently late and secondary character of the twin type in the birth myths justifies the separation of this part of mythology from the present theme. As regards the Romulus saga, Mommsen[46] renders it highly probable that it originally told only of Romulus, while the figure of Remus was added subsequently, and somewhat disjointedly, when it became desirable to invest the consulate with a solemnity founded on the old tradition.

HERCULES[47]

After the loss of his numerous sons, Elektryon betroths his daughter, Alkmene, to Amphitryon, the son of his brother, Alkäos. However, Amphitryon, through an unfortunate accident, causes the death of Elektryon, and escapes to Thebes with his affianced bride. He has not enjoyed her love, for she has solemnly pledged him not to touch her until he has avenged her brothers on the Thebans. An expedition is therefore started by him, from Thebes, and he conquers the king of the hostile people, Pterelaos, with all the islands. As he is returning to Thebes, Zeus in the form of Amphitryon[48] betkes himself to Alkomene, to whom he presents a golden goblet as evidence of victory. He rests with the beauteous maiden during three nights, according to the later poets, holding back the sun one day. In the same night, Amphitryon arrives, exultant in his victory and aflame with love. In the fulness of time, the fruit of the divine and the human embrace[49] is brought forth and Zeus announces to the gods his son, as the most powerful ruler of the future. But his jealous spouse, Hera, knows how to obtain from him the pernicious oath, that the first-born grandson of Perseus is to be the ruler of all the other descendants of Perseus. Hera hurries to Mykene, to deliver the wife of the third Persides, Sthenelos, of the seven months child, Eurystheus. At the same time she hinders and endangers the confinement of Alkmenes, through all sorts of wicked sorcery, precisely as at the birth of the god of light, Apollo. Alkmene finally gives birth to Herakles and Iphikles, the latter in no way the former's equal in courage or in strength, but destined to become the father of his faithful friend, Iolaos.[50] In this way Eurystheus became the king in Mykene, in the land of the Argivians, in conformity with the oath of Zeus, and the after born Herakles was his subject.

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[45] Some Greek twin sagas are quoted by Schubert (loc. cit., p. 13, et seq.) in their essential content. Concerning the extensive distribution of this legendary form, compare the somewhat confused book of J. H. Becker, "The Twin Saga as the Key to the Interpretation of Ancient Tradition. With a Table of the Twin Saga." Leipsic, 1891. German text.

[46] Mommsen, "Die Remus Legende," Hermes, 1881.

[47] After Preller, Greek Mythology (Leipzig, 1854, II, pp. 120 et seq.).

[48] The same transformation of the divine procreator into the form of the human father is found in the birth history of the Egyptian queen, Hatshepet (about 1500 before Christ), who believes that the god Amen cohabited with her mother, Aahames, in the form of her father, Thothmes the First (see Budge: A History of Egypt, V; Books on Egypt and Chaldea, Vol. XII, p. 21, etc.). Later on she married his brother, Thothmes II, presumably the Pharaoh of the Exodus, after whose dishonorable death she endeavored to eradicate his memory, and herself assumed the rulership, in masculine fashion (cp. the Deuteronium, edited by Schrader, II ed., 1902).

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[49] A similar mingling of the divine and human posterity is related in the myth of Theseus, whose mother Aithra, a friend of Poseidon, was visited in one night by this god, and by the childless King Aigeus of Athens, who had been brought under the influence of wine. The boy was raised in secret, and in ignorance of his father (v. Roscher's dictionary, article Aigeus).

[50] Alkmene bore Herakles as the son of Zeus, and Iphikles as the offspring of Amphitryon. According to Apollodorus, 2, 4, 8, they were twin children, born at the same time; according to others Iphikles was conceived and born one night later than Herakles (see Roscher's Lexicon, Amphitryon and Alkmene). The shadowy character of the twin brother, and his loose connection with the entire myth, is again evident. In a similar way, Telephos, the son of Auge, was exposed together with Parthenopaüs, the son of Atalantis, nursed by a doe, and taken by herders to King Korythos. The external subsequent insertion of the partner is here again quite obvious.

(*To be continued*)

Periscope

Jahrbücher für Psychiatrie und Neurologie

(Vol. 33, Parts 2 and 3. 1912)

1. Review of the Old German Myelitis Literature. Max Neuburger.
2. Traumatic Porencephaly with Epilepsy. Otto Glaser.
3. Examination of the Brains of Cats and Dogs, with Regard to the Sex and Development. Juljusz Morawski.

1. *Old German Myelitis Literature.*—A detailed critical comparison of the various theories regarding the origin, pathology and clinical course of myelitis as shown in the writings of the early authors. Investigation into the pathology of the spinal cord inflammations was begun by Peter Frank in 1791. The early writers made no attempt to separate the inflammations of the cord from those of the membranes and even considered such a separation as impossible or worthless. But about the middle of the nineteenth century a new epoch began in the study of myelitis as a result of more careful studies of the pathology, histology and clinical manifestations and the limits of myelitis were more sharply defined. The author has collected the salient points from the writings of all the important German writers on this subject, and presents them in a concise and interesting manner.

2. *Traumatic Porencephaly with Epilepsy.*—A report of three cases in which porencephaly resulted from trauma to the head and was followed later by epileptic convulsions. In case No. 1 the diagnosis of porencephaly was made on the clinical history of trauma to the head at age of two years, and the radiographic findings of localized thinning of the skull, but the diagnosis was not confirmed by operation. In case No. 2 the porencephaly was found at operation for a depressed fracture of the skull, resulting from an injury received 13 years previously. At the operation a cyst was found communicating with the right lateral ventricle. In the third case a porencephalic cyst was found at operation. The patient, a female aged 28 years, received a severe injury to the head at age of two years. Epileptic attacks began at age of 22 years.

3. *Examination of the Brains of Cats and Dogs.*—This article is accompanied by numerous tables and charts showing the results of the investigation of the brains of cats and dogs in regard to the development of the fissures, etc., and is not suitable for abstracting.

E. A. Sharp (Buffalo, N. Y.).

Brain

(Vol. 35, Part 1)

1. The Cyto-Architecture of the Cerebral Cortex of the Human Foetus of Eighteen Weeks. J. S. Bolton and J. M. Moyes.
2. A Case of Generalized Streptotrichosis With Extensive Lesions in the Central Nervous System. W. W. C. Topley.

3. Progressive Spinal Muscular Atrophy of Infants [Werdnig-Hoffmann Type]. F. E. **Batten** and **Gordon Holmes**.
4. Progressive Spinal Muscular Atrophy of Young Children [Werdnig-Hoffmann Type]. L. **Parsens** and D. **Stanley**.

1. *Cyto-Architecture of Fetus.*—The author's own summary of this paper is as follows: (1) Considerable progress has already occurred with regard to the specialization of cortical areas and the differentiation of neuroblasts; (2) the Betz-cells are well developed, and the relatively very large Betz-cell area can be accurately mapped out; (3) the visuo-sensory area can be defined with accuracy. In the case of this area, however, specialization of the cortex and differentiation of the neuroblasts are both less advanced; (4) the pre- and post-central cortices and the visuo-sensory area already possesses the adult relationships to the Rolandic and calcarine fissures respectively; (5) the pre- and post-central cortices are remarkably well evolved in comparison with the rest of the cortex; (6) the cingulate cortex is of poor quality but is relatively well advanced in development; (7) the anterior frontal cortex, on the other hand, is throughout its depth extremely embryonic in stucture; (8) there is very definite evidence that, in the complex of phylogenetic and ontogenetic factors which subserve the process of evolution, the latter from a very early period play a predominant part; (9) the cleavage of the developing neuroblasts of the cortex into upper and lower portions, which enclose between them the precursor of the inner line of Baillarger, takes place at a much earlier period than we have hitherto supposed. This is clear, since this line (L. IV) is indicated in the rudimentary anterior frontal cortex, and since the Betz-cells which are contained in the prefrontal region are so well developed.

2. *Generalized Streptotrichosis.*—The author concludes that the case which he reports in extenso presented extensive lesions in the central nervous system, consisting of a basal lepto-meningitis, and of multiple cerebral abscesses. These lesions were proved to be streptotrichial in nature by the demonstration of colonies of the organism in microscopical sections. There was no disease of the cranial bones or of the soft tissues of the head or neck, but extensive streptotrichial lesions were found elsewhere in the body. It is therefore clear that the cerebral lesions resulted in this case from an infection of a pyemic type, and not as the result of extension from the neighboring parts, and a study of the literature would suggest that the infection by the blood stream is the rule in cases of streptotrichosis in this situation. Colonies of the streptothrix found in the cerebral lesions showed certain marked differences from those found in the liver and lungs, and these differences may perhaps be accounted for by the different forms in which the infection may have been carried, in the one case as true spore-forms from the preëxisting pulmonary lesions, in the other as short filaments, which would appear to be the more common method.

3. *Werdnig-Hoffmann Atrophy.*—Clinical and pathological report of a case in which the clinical diagnosis presented some difficulties. The marked loss of tone in the muscles, together with their weakness, suggested at first that the case was one of myotonia congenita. The onset of the weakness during the first nine months of life, and its progressive nature, however, indicated that the condition was similar to that described by Werdnig and by Hoffmann in young children under the title of "Progressive Muscular Atrophy of Infants." In support of the view that the

condition was due to a spinal atrophy, attention should be called to the facts: (1) That the intercostal and abdominal muscles were weak and paralyzed; (2) that the paralysis of all the more proximately situated muscles was relatively greater than of the distal muscles, and (3) that the loss of tone—hypotonia—was not so great in relation to the paralysis as that which is seen in typical cases of myatonia congentia. Neither the absence of the deep reflexes nor the electrical reactions could aid in the differential diagnosis.

On the pathological side the evidence is strongly in favor of regarding the condition as primarily myelopathic. The loss and atrophy of the motor cells of the ventral horns is very striking, and although similar cases have been described in a few cases of myopathy it has never been so severe, and in most cases no such atrophy of the spinal motor cells is present. A similar diminution in the number and in the size of the cells has been found in the condition described by Oppenheim as myatonia congenita (Baudouin, Collier and Holmes), but it has not been nearly so severe as that which we found in this case. It is, however, not altogether easy to confirm the view that in this case the disease is a primary myelopathic affection due to a degenerative process affecting the cells of the ventral horns, for no evidence of this degeneration in actual progress can be obtained either by the Marchi or by the Nissl method; though the latter method shows chromatolytic changes in a few cells, yet the essential feature is the smallness and normal appearance of such cells as are present. Even the muscle-changes cannot decide the question definitely, as it is now generally recognized that the histological differences between the primary and the secondary muscular atrophies are not so sharp and distinct as was at one time believed. Many of the changes which the authors have described in the muscle-fibers resemble closely those of the primary myopathies—smallness and atrophy of most of the fibers, increase in size and hypertrophy of others, central degeneration and fission of some of the hypertrophied fibers—and if a distinction must be drawn it must be in the relatively small amount of connective tissue that is found between the individual fibers, and in the absence or rarity of free muscle-nuclei, as compared with that which exists in dystrophic muscles. On the other hand, such features might be expected to occur if a dystrophy commenced at an exceptionally early age, when the development of the muscle fibers is not completed or so advanced as at the age at which the disease usually sets in. It may be pointed out that the same relatively slight fibrosis of the affected muscles and rarity of free muscle-nuclei has been found in myatonia congenita, a disease which also sets in very early in life.

4. *Werdnig-Hoffmann Atrophy.*—Clinical and microscopical report of patient with features similar to the previous one.

JELLIFFE.

Allgemeine Zeitschrift f. Psychiatrie

(Band LXIX, Heft 5)

1. Dementia Paralytica Among the Natives of Java and Madura. P. C. J. VAN BRERO.
2. Exciting Causes of Certain Neuroses and Psychoses. H. BERTSCHINGER.
3. The Significance of Schopenhauer for Psychiatry. OTTO JULIUSBERGER.
4. The New Laws with Regard to the Care of the Insane and the New Organization of this Care in Saxony. DR. HOESEL.

1. *General Paresis.*—It has frequently been stated that, among the uncultivated races, general paresis is very rare or does not exist. The

author, formerly Director of the Asylum at Lawang, Java, among 626 natives admitted to this institution between 1902 and 1909, found 33 paralytics, or nearly 5.3 per cent. (Javanese 5.4 per cent., Sudanese 6 per cent., and Madurese 2.8 per cent.) The population of the Islands is occupied almost exclusively with agriculture, conditions of life are not hard, the people are Mohammedans in religion, largely fatalists and take little thought for the morrow, so that their circumstances do not favor rapid exhaustion of the nervous system. Syphilis is of course common. The symptomatology of their general paresis does not specially differ from that found in Europeans, though the classical, exalted form is far more common than the dementing form. The duration of the disease cannot be accurately fixed, since the physician never sees a case until it is well advanced, and these people pay little attention to dates or to details. No case was seen in a woman. In 21 cases there were signs of previous syphilis, one was suspicious, in 9 there was no evidence of infection and in 2 the matter was undetermined. As to the relative infrequency of general paresis among uncultivated races, while syphilis is so common, the author thinks that there is evidence to show that in them, syphilis tends specially to attack the skin and the bones, avoiding the nervous system. In the tropics the skin forms a locus minoris resistensiæ, since on account of the natives mostly going naked and the abundance of parasites it is specially exposed to trauma, besides which the hot moist climate probably has upon it an unfavorable influence.

2. *Exciting Causes of Certain Neuroses and Psychoses.*—In his "Wild Duck" Ibsen makes one of his characters say "Take away from an average man the 'Life-lie' and you rob him at once of good fortune." According to our author nearly everyone is living this "life-lie," is deluding himself with the idea that he is really fortunate and happy, when in his heart he knows that such is not the truth. Let undeception come, and if the soil is already prepared, the outbreak of a severe neurosis or psychosis is determined. Such a factor he believes is frequently at the bottom of an outbreak of mental unbalance coming on at a certain time, say at 30, 50 or 60 years. The patient has lived his (or her) "lie" and can no longer avoid the truth, which is however too painful to stand and there is a mental breakdown. The hope that fortune will change for the better is the stimulus which carries us through most of our trials and when we reach a period of life when we have to admit—if only to ourselves—that a change for the better is most improbable, this stimulus is taken away and the weakened nervous system may yield. The author connects the unsatisfied aspirations long repressed, but in the end fatal, mainly with the sexual sphere and most of his illustrative cases are instances of abnormal or repressed sexuality. The *man* of unsatisfied hopes and aspirations is apt to resort to what the author calls "permanent narcosis" through alcohol which in the end must exert its destroying effect. The woman who has not been able to reach her ideal in relations with the opposite sex resorts to a process of sublimation, or in phantasies, usually of a religious character, still hoping for the day when her ideals may be realized. With the passing of the years the probabilities of a marriage proposal becoming less and less, in the thirties, or later about the menopause, she at least must give up her life-lie and the undeception is fatal. The cases which the author narrates present the most varied clinical pictures as of hysteria, anxiety neurosis, imperative conceptions, schizophrenia, late katatonia, manic-depressive psychosis and presenile melancholia. In all, the author thinks that the giving up of the "life lie" played a causative rôle.

Why, since the nature of the psychological conflict was in all cases so similar, the clinical pictures were so dissimilar, he cannot say.

He expresses his surmises in the following language, however: "At the basis of every neurosis and psychosis there lies the impossibility of adapting the claims of fortune, especially those of a psycho-sexual nature, to the slight possibilities of the realization of these claims in actuality. This inability depends, in part perhaps, upon congenital disposition, but in greater part upon influences brought into play by early surroundings. Nearly always, however, there are other external conditions, factors arising from circumstances of life,—in the broadest sense of the word,—are needed to produce from the original inadaptability a manifest disease. Whatever this may be it does not seem to me to be determined by exogenic influences. I lean much more to the view that the form and manner in which a person reacts to the inadaptability of his claims of fortune with the truth, depends upon a congenital, hereditable disposition, to a special determined manner of reaction."

3. *The Significance of Schopenhauer for Psychiatry.*—That the pessimistic philosopher in many of his ideas anticipated the views of present-day psychiatrists is clearly shown by the author's quotations from his writings. Especially in his parallelism with Wernicke, in his views with regard to the autopsyche and the allopsyche, and with regard to hyperquantivalent ideas remarkable, though they differ at other points. In his views as to the importance of the sexual element in mental pathology and in his estimate of the rôle of wish-fulfilment in some delusional conditions he appears as a forerunner of Freud. In his ideas as to crime and criminals, we see certain things since more developed by Lombroso. He regarded all punishment based upon revenge as unethical and wrong though as a deterrent from crime he thought it unavoidable. On this account he did not wish the abolishment of capital punishment and even expressed himself in favor of the castration of habitual criminals. Those specially interested should consult this article in the original.

4. *Care of Insane in Saxony.*—Of local interest chiefly.

C. L. Allen (Los Angeles).

Journal of Mental Science

(Vol. 55, No. 220)

1. The Physical Basis of Consciousness. H. Maudsley.
2. Katatonia: in Relation to Dementia Præcox. W. Julius Mickle.
3. Bacteriology of the Cerebro-Spinal Fluid in General Paralysis of the Insane. W. Ford Robertson and R. Dods Brown.
4. Some Aspects of "Maniacal-Depressive Insanity." M. J. Nolan.
5. Report on Thirty-one Cases of Maniacal-Depressive Insanity. James Cotter.
6. Maniacal-Depressive Insanity Amongst Male Admissions to Richmond District Asylum—1907. J. M. Redington and P. J. Dwyer.
7. On the Maniacal-Depressive Insanity of Kraepelin. Thomas Drapes.
8. The Case for Dementia Præcox. Thomas Johnstone.

1. *Physical Basis of Consciousness.*—The author shows that there is no abstract and constant consciousness. The individual life of relation gradually evolves a consciousness which in the infant is slight but develops progressively by experience as the years go on. "By the reflec-

tion of himself in others he becomes self conscious." The body itself is a unity and the conscious issue of its unified elements and energies, the conscious ego, varies in different persons, in the same person in different moods and at different periods of life. States of consciousness imply motor reaction. "No one would be conscious of an outer world, and therefore conscious of himself as a self, did he not react motorially to it." The anomalous states of consciousness found in hysteria, catalepsy, epilepsy, hypnotism, etc., and the modifications in the transition from waking to sleep and the approach of death are accounted for by the simile of an expiring candle, consciousness flickering, "with the waning activities of the mental organization, as they cease irregularly in different parts of it."

2. *Katatonia: Relation to Dementia Præcox.*—A critical discussion of dementia præcox in its three so-called forms. The author lays special emphasis upon katatonia, which he regards as "by far the predominant constituent element" of dementia præcox and therefore is inclined to substitute "katatonic insanities" or "katatonic dementia" for the term dementia præcox.

3. *Bacteriology of Cerebro-Spinal Fluid in General Paralysis.*—Twenty cases were examined and from four a growth of a diphtheroid bacillus was obtained. The same infection they have found in the nasal lymphatics and the hypothesis in offered that general paralysis may be due to infection in consequence of an intracranial deviation of the flow of a toxic nasal lymph, the deep lymphatics of the nose communicating with the intracranial lymphatic system.

4. *Some Aspects of "Manic-Depressive Psychosis."*—The writer fails to appreciate the teaching of Kraepelin and is unable to see the justification of the manic and the depressed phases of manic-depressive insanity. On the other hand he favors the term maniacal-depressive insanity as applied to the mixed form. He also concludes that "the incidence of the mixed form attack is intimately associated with the stress of age epochs, toxic influence (alcohol, etc.) and with sexual excesses." The syndrome may be found with marked congenital mental deficiency, in epilepsy, in a certain class of general paralysis and after operations.

5. *Report on Thirty-one Cases of Manic-Depressive Psychosis.*—A statistical report, there being 16 males and 15 females or 19.6 per cent. of the total number of new cases for a year. Strange to say the writer states that there were no cases of the maniacal type. He classifies most of the cases as mixed, dividing them into two groups, (*a*) showing exaltation and depression in a single attack, (*b*) showing exaltation or depression separated by a well-marked lucid interval.

6. *Manic-Depressive Psychosis.*—Of 292 admissions only one case seemed to belong to the mixed variety. This is in striking contrast to the findings of the preceding writer. Most of this article is taken with the description of a case which had several attacks of a psychosis, both manic and depressed in type.

7. *Manic-Depressive Psychosis of Kraepelin.*—A criticism of the term maniacal-depressive insanity in which the writer concludes that there is no such distinct psychopathic entity. The writer attempts to prove the incorrectness of the conception of manic-depressive psychosis by the bald unsupported statement that the term may very aptly cover certain forms of mixed psychoses into which class "may be thrown quite a large number, if not a positive majority of the cases of chronic psychosis which people our asylums, who during some particular day, week or month, exhibit one phase of mental derangement and at other times a totally

different one." This article is an excellent illustration of the usual English concept of "insanity" as an entity. One disease.

8. *The Case for Dementia Præcox.*—It is a pleasure to find among so many articles giving a wrong conception of the generally accepted Kraepelian idea, one which presents a clear exposition of dementia præcox. The author answers the criticisms of dementia præcox which appeared in former numbers of *The Journal of Mental Science.* Several pages of discussion following, by various prominent English alienists, are particularly interesting as showing the general attitude as well as much misinformation concerning Kraepelin and his teachings.

(Vol. 55, No. 221)

1. Presidential Address in the Section of Neurology and Psychiatry, Australian Medical Congress, Melbourne, October, 1908. Eric Sinclair.
2. Legal Duties and Responsibilities of the Medical Profession in Matters of Lunacy. T. Prout Webb.
3. Treatment of Insane in Great General Hospitals. A. R. Urquhart.
4. Note on General Paralysis. W. Julius Mickle.
5. Menstruation in its Relationship to Insanity. Sheila M. Ross.
6. Research into Cranial Measurements of the Insane, comparing them with those of the Sane. David Thomson.
7. Certification of Mental Defectives as Proposed by the Royal Commission. H. B. Donkin.

1. *Presidential Address, Australian Medical Congress, Melbourne, 1908.*—This address covers in a concise way "the conditions, legal and medical, connected with the administration of lunacy in Australia." Admissions to insane hospitals are usually by one of two methods, a magistrate's order or by the request of friends accompanied by two medical certificates. Patients are commonly kept under observation in jails and, as a rule, cases are dealt with in a police court, both of which are obviously objectionable features. Reception houses are provided for in most of the states but only three have built any. Here patients may be detained whose insanity has not yet been determined and those whose papers have not been completely made out. Only one state admits voluntary patients, it being necessary for two justices to consider the application. They may give their consent for his admission for a fixed period at the expiration of which he is discharged, but the period may be extended from time to time by the justices. A twenty-four hours' notice is required should the patient desire to leave the hospital. Mechanical restraint is used but the use is efficiently inspected. In several states a boarding-out system is provided for harmless patients and in these states relatives who are willing to take charge of unrecovered patients, but cannot afford to do so, may be granted a monetary allowance.

A master in lunacy is appointed by the state, who is public trustee of patients admitted to hospitals, and administers their affairs. An inspector general is the official head of the service and is required to pay regular visits of inspection.

2. *Legal Duties and Responsibilities.*—Under the statute law the medical practitioner has no greater privilege or protection in cases of insanity than the ordinary layman. In order that legally the proper care

and protection of the individual and th
liberty may be undertaken the physici
the fact of an insane condition sufficien
Sentimental arguments against commi
only the patient's best interest consider

3. *Treatment for Psychoses.*—An
lantern slides showing plans of asylum
tistics, etc. The writer favors the n
patients, looking to "the recovery of the
and the after-care of the convalescent."

4. *Note on General Paralysis.*—The
by Drs. Clarke and Atwood (*Journal*
Sept., 1907) in which they state "not a
nosticate general paralysis in the absen
of the disease, a view we believe to be
two decades ago." He calls attention t
and second editions of his book and disc

5. *Menstruation in Relation to Ps*
five cases were examined. Menstrual di
of all cases of mental disease in wome
insanity than a cause, being a symptom
disorders were present in one third of t
mania this function is as a rule reg
amenorrhea was present in over fifty per
amenorrhea or marked irregularity of m

6. *Cranial Measurements of the In*
level of the glabella and occiput, the ant
the occipital protuberance to the glabel
from ear to ear of 408 male patients w
male attendants, note also being made of
patients and attendants were from p
population.

The sane seemed to have the best cr
organic brain disease patients, epileptics,
paralytics being next. As one would expe
the poorest measurements. True psycho
cholia and syndromes, resulting in early d
with physical degeneracy.

7. *Certification of Mental Defectives.*
the Royal Commission, deals with the que
feeble-minded class or high-grade imbec
pended followed by considerable discussi

W. C.

Book Reviews

THE MODERN TREATMENT OF NERVOUS AND MENTAL DISEASES BY AMERICAN AND BRITISH AUTHORS. Edited by William A. White, M.D., and Smith Ely Jelliffe, A.M., M.D., Ph.D. Vol. I. Lea and Febiger, Philadelphia and New York, 1913.

As yet only the first volume of this interesting and excellent system has appeared. Its object, as the editors state, is to fill a gap left by other systems and text-books. These have described disorders of gait, of power, of sensation, and of related phenomena, to the neglect of the larger human problem of the individual, the man, the biological unit, and his social relations. All such works have stopped short at the point where they should have begun. They have told us how to patch up broken machinery, but rarely have they suggested or given directions for avoiding the wrecks.

This new system lays emphasis upon the psychical side of life as being equally valuable with the physical. In the first volume the space is largely given to mental problems. The prevention of nervous and mental disease is considered exhaustively under such headings as: Eugenics and Heredity, Education, Sexual Problems, Educational Treatment of the Feeble-minded, Prison Psychoses. These will answer to illustrate the broad scope of the work. It is intended for physicians, but also for educators, legislators, judges, lawyers and others interested in the problems concerning the highest development of man.

In the chapter on Eugenics and Heredity, White shows that the term heredity is frequently used in a very loose manner, and that it has been a short path for escaping from a difficulty without a proper understanding of what it implied. Heredity is of vast importance in race betterment, but eugenics does not deal solely with heredity; environment plays an important role. As a great change has taken place in public opinion regarding alcoholism, so it is conceivable that a similar change may occur in the attitude toward marriage. The question of health will receive its proper consideration in this important relation of life.

The great importance of instinct and of the proper training of it is discussed by Colvin in his chapter on education. The instincts of curiosity, of acquisitiveness, of constructiveness, etc., may be of great service in the development of the child. This is a chapter of special value to the teacher.

Havelock Ellis writes on sexual problems. These the physician can not escape, and under the influence of Freud they have become very important. His views are considered by Ellis but they do not dominate this chapter.

Goddard is well fitted to write on the educational treatment of the feeble-minded. He gives the various tests used in determining the mental development of defectives and the mthods of training these persons.

In the chapter on Delinquency and Crime by William Healy the various mental conditions which lead to crime are considered. The importance of this subject is shown in his statement that many cases of brutal crime might have been prevented if the conditions had been recognized and proper treatment applied.

Immigration and its relation to the health of the country are discussed by Salmon. He shows how the type of immigrants has changed from the early settlers to the influx of the present day. Those who came early sought religious and personal liberty, but such motives have not been the prevailing ones in more recent arrivals. "In Congress immigration is a political question, not a medical or social one." America, however, is awakening to the importance of the study of health problems by the federal government.

The question of alcoholism is one of pressing importance. When one reads in the report of a Massachusetts Commission appointed in 1910 to investigate the increase of criminals, mental defectives, epileptics and degenerates that it is the belief of this commission that the abuse of alcohol does more to fill our prisons, insane hospitals, institutions for the feeble-minded, and almshouses than all other causes combined, he can understand why H. W. Mitchell has been assigned a chapter in this book on alcoholism.

The chapter on the treatment of the neuroses, including the psychoneuroses, by Ernest Jones is a comparatively long one, since this class of patients, borderland states, etc., are so numerous. The selection of the author for this subject could not have been better. Whatever views one may entertain concerning Freud's work an impartial student must acknowledge that Jones is one of the best (possibly the best) exponents of his work in English. He is an interesting writer and avoids objectionable expressions as far as possible. He discusses a subject that is receiving the greatest attention, viz., psychoanalysis. While Jones does not accept Babinski's "persuasion" and "suggestion" as radically different, he believes the persuasion stimulates the patient to take an active share in modifying his mental state. He regards the psychoanalytic method as superior to all others in the treatment of hysteria, but he has no desire for the assistance of the clergy.

The chapter by J. J. Thomas on traumatic neuroses and psychoses and occupation neuroses is an able presentation of the subject by one who is not a pronounced Freudian, and affords a contrast to the chapter immediately preceding which is dominated by the influence of Freud. Thomas devotes considerable attention to the French school, to Charcot and Babinski, and yet he does not believe that all the symptoms of hysteria are suggested. He states he has seen anesthesia that could not have been caused in this way. He discusses many important subjects, such as the protection of workmen and the influence of lawsuits.

Southard treats of the symptomatic psychoses, viz., those caused by infections, exhaustions, etc. He sides with Bonhoeffer against Kraepelin in the conviction that the most varied causes in this group yield a comparatively small number of symptom-pictures. Many of the symptoms are not produced by the immediate intoxication but by what he calls the tertium quid, a metatoxin such as is supposed to be the cause of paresis.

In the chapter on the Manic-depressive Psychoses by Farrar and in that on the Paranoic and Paranoid States by Mayer a short but sufficient account of the disorders is given. The chief accent is laid on the therapy where complete details are found. The uncertain distinction between certain cases of manic-depressive insanity and those of dementia præcox is expressed by Farrar in metaphorical language: "Even the reservoir of dementia præcox, which during the earlier ascendency of that disease-concept was overfilled at the expense of the affect psychoses, is now giving back some of its borrowed waters into manic-depressive channels." Meyer does not regard Dubois' reëducation method as very successful in paranoid states, indeed it is "notoriously unavailing in most cases." In paranoia, as in so much relating to mental processes, Freud's influence is apparent.

There are other chapters of equal importance in this excellent book, as those on the Presenile, Arteriosclerotic and Senile Disorders of the Brain and Cord, by Barrett, and May's on the Functions of the Hospital. The editors have made a wise selection of authors for the different chapters and have chosen well-known men. The book is a plea for the importance of preventive medicine, and moreover as a work on Treatment, the title of the work accurately describes the contents; it is a book really devoted to treatment, actual, as well as prophylactic.

SPILLER.

CREATIVE EVOLUTION. By Henri Bergson. Authorized Translation by Arthur Mitchell, Ph.D. Henry Holt & Company, New York.

It is not our purpose here to give an outline of the Bergsonian philosophy. Such would serve little purpose in this journal devoted to the problems of nervous and mental disease. But inasmuch as we feel that the point of view outlined in the volume here cited may prove of great service to all interested in neurological as well as psychiatrical questions some consideration may be given to Bergson's views. Furthermore, since Bergson's hypotheses concerning intuition and instinct have such a close relationship to Freud's views of the unconscious the value of Bergson to psychoanalytic students becomes all the more evident, especially as the problem of the unconscious is approached from an entirely different angle.

Thus, in the very opening of Bergson we find a statement which so far as this insistence on the persistence of psychic material and its effects upon character are concerned reads strangely like the Freudian conception of the importance of the unconscious: "Duration," Bergson writes, "is the continuous progress of the past which gnaws into the future and which swells as it advances. And as the past grows without ceasing, so also there is no limit to its preservation. Memory, as we have tried to prove, is not a faculty of putting away recollections in a drawer, or of inscribing them in a register. There is no register, no drawer; there is not even, properly speaking, a faculty, for a faculty works intermittently, when it will or when it can, whilst the piling up of the past upon the past goes on without relaxation. In reality, the past is preserved by itself, automatically. In its entirety, probably, it follows us at every instant; all that we have felt, thought and willed from our earliest infancy is there, leaning over the present which is about to join it, pressing against the portals of consciousness that would fain leave it outside. The cerebral mechanism is arranged just so as to drive back into the unconscious almost the whole of this past, and to admit beyond the threshold only that which can cast light on the present situation or further the action now being prepared—in short, only that which can give *useful* work. At the most a few superfluous recollections may succeed in smuggling themselves through the half open door. These memories, messengers from the unconscious, remind us of what we are dragging behind us unawares. But, even though we may have no distinct idea of it, we feel vaguely that our past remains present to us. What are we, in fact, what is our *character*, if not the condensation of the history that we have lived from our birth —nay, even before our birth, since which we bring with us pre-natal dispositions? Doubtless we think with only a small part of our past, but it is with our entire past, including the original bent of our soul, that we desire, will and act. Our past then, as a whole, is made manifest to us in its impulse; it is felt in the form of tendency, although a small part of it only is known in the form of idea."

Here we have a re-statement of Freud's Pleasure and Reality principles, of Jung's Directed and Phantasy thinking, of Bleuler's Logical and Autistic thinking.

But it is not with the analogies of Bergson to psychanalytic principles that we are concerned, beyond noting their existence and the stimulus that comes to the doctrine through the work of the well known French philosopher.

Bergson lays great weight upon what he calls "intuition or instinct" —whereas Kant strove to formulate a safe guide for philosophy, he constructed categories which Bergson notes were excellent for the stage of science then in existence—*i. e.*, the more exactly mathematical or physical sciences. Intelligence was able to formulate a general form to cover all experience. Intuitions for Kant were infra intellectual. With the newer sciences of biology and psychology, however, dissimilar types of objectivity appear. Science thereby becomes less and less objective, more and more symbolic as it proceeds from the physical to the psychical, passing through the vital. Then as it is certainly necessary to perceive a thing in some way in order to succeed in symbolizing it, there would be an intuition of the psychical, and, more generally of the vital, which the intelligence would doubtless transpose and translate, but which, none the less transcend the intellectual.

It is this schism, as it were, between the intellectual and the instinctive, that Bergson lays so much stress upon. Yet, it is not so much a schism as a difference in tools, each being used for a different purpose, yet combined in their use they have made it possible for man to advance. Intelligence is the instrument for practical work—it succeeds in the understanding of the physical sciences because of their useful character. Through science we can influence things. Intelligence enables us to handle them, but only as dead matter. We part with intelligence the minute we attempt to understand the living force. Here one needs, not the tool that deals with the inert, the circumscribed, but one that is concerned with the flow of life and its ceaseless change. Had one only intelligence to reckon with there would be no evolution, no creation. This is the work of the instinct. It works not as the scientist, but as the poet, the artist: it expresses itself in metaphor, image and symbol, clear conceptual expression being reserved for the products of the scientific intelligence.

Intelligence can grasp the mechanical, the static. It is inherent as a faculty of action which must isolate and predict—which indeed must isolate and eliminate differences in order to predict. Intellect is dominated by the faculty of identity. It sees only resemblances and differences. It deals with moments in consciousness, but of the stream, the force it can know nothing.

Fortunately for man, however, in addition to intelligence he has instinct. Unconscious instinct is sympathetic action—conscious instinct is sympathetic insight. "We men," he writes, "though our mental outfit is primarily an intellect, carry with us something of this other element instinct with which intelligence was fused in the original generative force of all life. Not in entire forgetfulness have we come; intelligence has not separated itself entirely off from instinct. As intelligences we have travelled away from our home in an attempt to gain the victory over matter, and we remember scarcely anything of the land from which we have come." In the language of psychanalysis, one sees the differences between conscious, directed thinking applied for useful purposes, and the unconscious, phantasy thinking, the latent content in the dream, which is concerning itself, through its own type of symbols, with the great instincts of life.

"But," Bergson continues, "this same intelligence, coincidentally with the conflict with matter, has gained a light—the light of consciousness—which will illumine that country if only we can get back again."

Bergson develops at length what he means by this intuition through which we grasp the meaning of life. He does not consider one faculty higher or lower than the other—they are complementary the one to the other. How far evolution has advanced through one alone, *i. e.,* instinct, he would show by the example of the highest social instincts. Had not intelligence happily been struck upon, social evolution to higher types would not have been possible.

In the introduction to this work he speaks of man, as being better defined as homo faber, rather than homo sapiens. He is not so much the knowing one as the manufacturing one. He manufactures tools, instruments by which he can cut into matter. Instinct is a faculty of utilizing and even constructing organized instruments. Thus instinct created the eye, the ear—whereas intelligence is the faculty of constructing and employing unorganized instruments. It makes printing presses, flying machines, and the like. These two, instinctive activity and intelligent activity, represent the divergent solutions of the problem which presented itself to the original psychical activity in its action upon matter. The problem was to create with matter, which is necessity itself, an instrument of liberty; to construct a machine which would triumph over the mechanical, and to make use of the determinism of nature in order to break through the meshes of the net which it has spread.

In another place he touches upon a problem near to medical experience. When we accomplish mechanically an habitual action, when the somnambulist acts automatically in his dream, the unconsciousness may be absolute; but it is because, this time, the representation of the act is held in check by the execution of the act itself; which is so perfectly similar to the representation, and fits so exactly into it, that consciousness can no longer burst forth. The representation is obstructed by the action. This is perfectly reasonable to the psychanalytic interpretation, for instance, of a hysterical paralytic conversion. The hysteric lives her paralysis in action, hence is unable to know the reason for the symbolism. It cannot come into consciousness, *i. e.,* into representation, because, as Bergson well says, the action obstructs it.

How familiar to the student of dream symbolism is the following: "The proof of this obstruction is, that if the accomplishment of the action is arrested, or hindered by an obstacle, consciousness may arise." This is precisely what happens when one is awakened by one's dream, when the dream work has not sufficiently distorted the wish of the sleeper as to evade the criticism of the censor.

One might multiply instances showing the specific applicability to mental medicine of the thought that runs through this work which has been so widely read and commented on in philosophical circles for a number of years. But apart from such applicability we recommend it particularly to our readers—especially to those who still perceive themselves to be in such a sympathetic attitude toward moving ideas that they can construct from them intellectual tools to cut into their particular problems, thus making their studies more vital, less formal and lifeless.

JELLIFFE.

HEREDITY IN RELATION TO EUGENICS. By Charles B. Davenport. Henry Holt and Co., New York.

Dr. Davenport's numerous contributions to the study of the problems of heredity have made him well known as an authority. It is therefore of special moment to the worker in medicine to be able to have collected in one place the chief facts and studies relative to the inheritance of diseases or of physical or psychical anomalies and defects.

The present volume does this in a masterly manner and presents for all who would know the best that can be obtained.

We heartily commend this volume.

DIE TABES DER FRAUEN. Von Kurt Mendel und Ernest Tobias. S. Karger, Berlin.

In this short and interesting monograph of 77 pages Mendel and Tobias have gathered the chief facts obtainable in clinical work concerning this disease in women. Tabes in women shows a number of anomalies when compared with tabes in men.

The material is drawn from the clinic during the past 10 years. This material showed in the ten years 279 men and 151 women or a percentage of 1.85–1.0. The Vanderbilt clinic material during the same 10 years showed 336 men and 47 women, a proportion of about 7–1. The authors give a complete list of authors showing variations of 1–1 to 27–1. A complete series of statistical tables offers abundant comparative material. A large amount of space is devoted to the anamnestic statistic concerning syphilis. The recent finding of the *Treponema pallidum* in paresis and in tabes renders all of this statistical argumentation of secondary value.

DIE MASTURBATION. Von Dr. med Hermann Rohleder, Leipzig. Dritte verbesserte und vermehrte Auflage. Fischers' Medicin Buchhandlung H. Kornfeld, Berlin.

This work is written for physicians, teachers and educated laymen. It contains a mass of orderly information with few ideas. It views onanism as a disease; a universal disease; one that is the most widespread of all diseases. It is more or less of a sin. Thus one may gather that this work is no attempt at a real understanding of onanism but is rather an old fashioned collection of statistical information and a priori notions, few of which are of any particular value.

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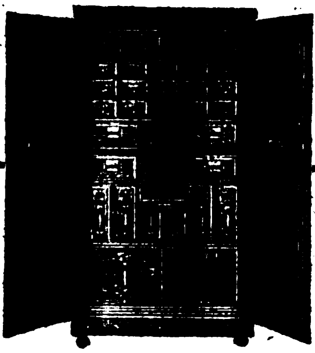

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Original Articles

A REPORT ON THE ANALYSIS OF THE CEREBRO-SPINAL FLUID WITH CLINICAL NOTES IN 109 CASES OF DISEASE OF THE NERVOUS SYSTEM NOT INCLUDING THE ACUTE MENINGEAL AFFECTIONS

By W. F. Schaller, M.D.

FROM THE NEUROLOGICAL CLINIC, DEPT. OF MEDICINE, LELAND STANFORD JR. UNIVERSITY, SAN FRANCISCO, CALIFORNIA

The material for this paper is taken from the records of 109 cases of nervous affections seen within the last two years. In this series I have not included purulent fluids such as are found in the acute meningeal processes and will only take up the consideration of that type of fluid in which the meningeal reaction is not expressed by any change in the gross appearance of the fluid from the normal state. Such fluids are the rule in syphilitic affections of the central nervous system, which make up a large number of the affections with which this paper deals. The analyses of these fluids were made before a treatment was commenced by us or did not follow any intensive treatment immediately preceding.

The analysis of the cerebro-spinal fluid is usually said to have begun with the introduction of the technique of lumbar puncture by Quincke (1) in 1891, but the investigation of the fluid in non-purulent affections of the meninges of the brain and cord had its origin in France in the researches of Monod (2) and of Widal (3) and his collaborators Sicard and Ravaut who occupied themselves with the cytology of the fluid; and in the work of Guillain and Parant (4) who investigated the protein content in normal and pathological fluid. These authors head the list of the large number of workers who subsequently occupied themselves with the subject of the diagnostic value of lumbar puncture. Kaupe (5) in 1906 collected the titles of 487 papers dealing with the analysis of the cerebrospinal fluid. Since 1906, when Wassermann, Neisser and Bruck published their method of sero-diagnosis in syphilis, much additional work has been done and the literature has correspondingly increased. The importance of the investigation of the cerebrospinal fluid has advanced to such a degree that it may be said that no examination of a case of nervous disease is complete without the information which this procedure affords.

Of those additional authors who have made important contributions to our knowledge of this subject are Nissl (6) who devised a means of determining the protein content quantitatively for clinical use; Fuchs and Rosenthal (7) and Nageotte (8) who invented a more accurate means of determining the cellular content; Plaut (9), Nonne (10) and the Hamburg school who have made comparative Wassermann tests both in the blood and the fluid in psychiatrical and neurological cases syphilitic in origin; Mott (11) who has presented us in the Oliver Sharpeley lectures with a comprehensive study of the different aspects of the fluid, and Noguchi (12) who has described a very delicate globulin test. In this country Rous (13) in 1907 published an excellent article which brought the subject up to date at that time. Amongst others Pomeroy (14), Waterman (15), Ebright (16) and Moffitt (17) have given us the results of their experience, and Kaplan and Casamajor (18) have published a laboratory report on an analysis of 340 fluids.

I do not propose to enter upon a discussion of the physical or the chemical properties of the normal fluid or to discuss any tests of the pathological fluid other than those which have an established value as an aid to clinical diagnosis. These are the pressure of the fluid, Fehling's reduction test, the globulin reactions, the cell count and the behavior of the Wassermann test in the fluid. A few points are of importance in these tests.

Puncture.—The routine puncture is done with the patient in the reclining position. The choice of a needle is an important point when it is desired to obtain a blood-free fluid for a complete analysis. Most satisfactory is the use of a small iridioplatinum needle of 7/10 mm. bore, furnished with a stylet which is ground to fit the point of the needle very accurately. This avoids tearing the vascular arachnoid on puncture, and the stylet is withdrawn only after the point of the needle has entered the subarachnoid space. Eight c.c. of fluid are withdrawn unless there be some special contraindication. In none of our cases was the puncture followed by serious results, although headache and vertigo were not infrequent accompaniments. These unpleasant results were found to occur very frequently after puncture in psychoneuroses while such an occurrence was unusual in parasyphilitic affections. The patient is required to remain in bed for a day afterwards with the head on a level with the rest of the body. It will be seen in referring to our records that lumbar puncture was done in 4 patients with brain tumor and one with tumor of the cord. Because of the report of a number of sudden deaths following puncture in the presence of brain tumor the following precautions are taken where the presence of a tumor is suspected: not more than 2 c.c. are withdrawn drop by drop; during the puncture and for two days afterwards the body is inclined so that the head is at a lower level than the rest of the body. With these precautions puncture in cases of tumor is apparently without danger. Vincent (19) at the Pitié in Paris has performed a lumbar puncture in a considerable number of cases of brain tumor without serious results. Schlesinger (20) while admitting that puncture has been followed by fatal results in brain tumor still advises its use as a therapeutic measure.

Pressure.—Although it has been pointed out that the measurement of the pressure of the fluid taken by means of its ascent in a glass tube of narrow bore is not strictly accurate for various reasons, it is sufficiently accurate for clinical purposes (Mott, 11). It is our custom to keep the diameter of the tube and conducting apparatus at as nearly a uniform diameter of 1 mm. as possible and the height of the fluid is read off in mm. The normal pressure should not exceed 150 mm. of fluid (Quincke).

Fehling's Reduction Test.—The normal cerebrospinal fluid contains a substance which reduces Fehling's solution and which is now regarded to be sugar. In the acute types of meningeal inflammation this reduction is absent while in the more chronic types, as in syphilitic and parasyphilitic processes, reduction still takes place. In our series it will be seen that in a number of cases of this type of disease the Fehling test is marked as negative. In these cases it is probable that there was a slight amount of reduction present but it was not discovered, as the specimen was not allowed to stand and precipitate as was done in the later tests. It will be seen that in the later cases reduction was constantly present. The amount of reducing substance was found to be variable, however, judging by the qualitative test. In two cases each of uremia, combined sclerosis (subacute form) and tabes, the reduction was marked.

Cytology.—It is now generally admitted that the most accurate means of determining the cell count of the fluid is by means of a cell-counting chamber, although Ravaut (21) still maintains that the centrifugal method has certain advantages. We use the Nageotte counting cell which has the advantage of permitting a large quantity of fluid to be used. It is advisable to count the cells in at least 5 c.mm. of fluid (Nageotte), diluted with Turck's fluid.[1] The acetic acid in this solution destroys the red cells and permits an accurate white cell count. It has been our custom to count two different specimens of the same fluid, one of the undiluted fluid and the other diluted with an equal quantity of Turck's fluid. As it rarely happens that a fluid is withdrawn that does not contain a certain number of red cells it is advisable to make a red as well as a white count. The examination of the red cell content may be of service in two ways: first, in order to make an allowance for the number of white cells present in the normal proportion of white cells to red; and secondly, in determining the number of red cells per c.mm. which by reason of the plasma protein added will influence the globulin tests. Two of our cases throw some light on this latter question. Cases No. 16 and No. 49 of our list contained 800 and 880 red cells respectively in 1 c.mm. of fluid. The fluids appeared normal and were so with the exception of a very slight increase in globulin, and as the clinical evidence was against the probability of an organic disease being present it would appear probable that the excess of globulin was due to the admixture of the small amounts of blood, hence in a fluid containing 800 cells per c.mm. the globulin determination is not of diagnostic value. One disadvantage of the Nage-

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[1] Glacial acetic acid	3 c.c.
Gentian violet 1 per cent. aq. sol.	2–3 c.c.
Aquæ dist.	300 c.c.

otte chamber is that on account of the depth of the cell (0.5 mm.) it is difficult to focus the field with the higher power dry lenses in common use. Satisfactory results are obtained, however, with a Zeiss instrument with *C* objective, No. 6 ocular. The fluid may be counted in an ordinary blood chamber after the method of Rous who counts the red and white cells in the same preparation. There is a difference of opinion as to what constitutes the upper limit of the normal leucocyte count. Nageotte (8) believes that the upper limit of the normal count per c.mm. is 2½ cells, basing his opinion on the examination of 56 normal fluids. Sahli (22), quoting Wegelin, states that as high a number of cells as 50 per c.mm. may yet be considered normal. The majority of observers, among whom may be mentioned Reichmann (23) and O. Rehm (24), hold that 10 cells is the upper limit of normal, but many observers are inclined to believe that this figure is too high. Nonne states that the normal fluid does not contain over 5 or 6 cells per c.mm. It appears from our series that 6 cells per c.mm. is the highest number that can be regarded as normal. This impression was derived from No. 25 of our list (neurasthenia) and No. 53 (multiple sclerosis), in which 6 cells were found in an otherwise normal fluid. Although it is exceptional not to find an occasional cell in examining large amounts of fluid, many of our fluids showed one cell or less to the c.mm. and seldom more than 3 cells were found to the c.mm. in a normal fluid. Differential counts were made in a number of cases but the results did not permit us to reach any conclusion as to the significance of the cells found unless of course there was a definite increase in the polymorphonuclear elements. It is the common experience of those who have made differential counts of the cells of the cerebrospinal fluid by the ordinary methods of spreading the centrifugalized sediment on a slide, drying and staining by one of the polychrome stains—we use Jenner's—that a very unsatisfactory specimen is obtained. This is in part due to the small amount of albumen present in the fluid and also since we are dealing here with cells which have in a large measure lost their power to take up stains. The wet method is preferable. The sediment obtained after centrifugalizing a specimen to which has been added Turck's fluid is put on a slide, covered with a cover glass and examined with a high power dry lens. This method will be quite sufficient to determine the difference between the lymphocytes and the polymorphonuclear elements. We are not prepared to discuss the work of Alzheimer (25) on the special methods of differentiation of the cells of the cerebrospinal fluid.

Proteins.—Much confusion exists as to the protein in cerebrospinal fluid in spite of the amount of work done. The normal fluid contains a very small amount of protein which is considered to be serum globulin by Guillain and Parant (4), Sicard (26), and Mott (11), and as serum albumen by Nissl (6), whereas Nonne and Apelt (27) and Henkel (28) regard both substances as present. In pathological conditions the proteins are increased, but this increase varies according to the character of the inflammatory process. Thus in acute forms of meningitis it is the serum albumen which is increased while in the forms of inflammation which are found in syphilitic and parasyphilitic affections it is the serum globulin which is in excess, attaining an amount equal to or exceeding that of the serum albumen present (Mestrezat, 29). This fact was taken advantage of by Nonne and the Hamburg workers as the basis of a test which they believe to be highly characteristic for syphilitic affections. This test (Phase 1) has attained such an importance that I shall trace its development from the work which preceded it. Guillain and Parant found that normal cerebrospinal fluid shows a slight opalescence on boiling and that after the addition to the normal fluid of an equal quantity of a saturated magnesium sulphate solution in the cold and filtering, the filtrate remains water clear after boiling. In a case of paresis the fluid showed a marked cloudiness on simple boiling. If the saturated magnesium sulphate solution be added to an equal portion of such a fluid in the cold, and the filtrate be boiled as before, the filtrate will also show a cloud. The conclusion reached was that in the normal fluid serum globulin is present but under pathological conditions serum albumen may also be present. These authors examined 16 cases of paresis. In these cases the globulin was increased and there was also albumen present. The increase in the proteins ran parallel to the increase in the cell count. It will be seen that in these experiments advantage was taken of the chemical principle that globulin is only soluble in weak salt solutions while albumen remains soluble in concentrated salt solutions. Nissl (6) in Germany was the next to take up this question and obtained somewhat different results. In collaboration with Cohnheim he modified the preceding experiments by precipitating globulin by means of ammonium sulphate and found this to be a more delicate test. The filtrate was acidified with acetic acid before boiling. His conclusions were that protein (Eiweis) was present in the normal fluid and that in its relation to salts it behaved as does albumen. Only 4 cases out of 158 showed an unmistakable opalescence after the addition of ammonium sulphate in the cold and it was therefore concluded that globulin did not play an important role in the fluid in either normal or pathological fluids. Henkel and Cimbal (30) again took up the question of the proteins and made a careful quantitative estimation after the method of Kjeldahl. Cimbal used zinc sulphate instead of ammonium sulphate and proceeded as usual by acidifying the filtrate and boiling. The first step in which the globulin was precipitated was called by him Fraction I, and the second step Fraction II. Fraction I was found normally present in the amount of 0.3 to 0.7 per liter while the albumen showed at the most a slight opalescence. On the contrary, in paresis Fraction I amounted to 0.9 to 1.5 per liter and Fraction II from 0.7 to 1.0 per liter. Nonne[2] uses ammonium sulphate for precipitating globulin and calls the reaction Phase I, while the acidified and boiled filtrate is designated as Phase II. It will thus be seen that Phase I and Phase II correspond to the Fraction I and Fraction II of Cimbal. The experiments of Nonne and his assistants were conducted with the large material of Eppendorf, and it was concluded that in paresis Phase I was present in 100 per cent. of cases whereas the total albumen was only increased in 75 per cent. In tabes Phase I was present in 90 per cent. whereas the total albumen was only increased in 55 per cent.

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[2] Phase I. 85 gm. of ammonii sulfur. purissimi neutralis (Merck) are covered with 100 gm. of distilled water and boiled in an Erlenmeyer flask until no more of the salt will be taken up in solution. The liquid is then allowed to cool slowly and is then filtered. 2 c.c. of this saturated solution is mixed with an equal quantity of the fluid to be examined and after 3 minutes compared with the untreated specimen. It is convenient to make this test in a test tube of small dimensions such as is used in serological work. Nonne distinguishes three grades of positive reactions:

1. When a distinct cloud is noted.
2. When the tube is held up against a window, or held against a dark background in direct light and an opalescence is seen.
3. In some of the fluids when the tube is held against a dark background and examined by direct light no opalescence is noted. If now the tube is so held that the light attains the tube from above—indirect light—a difference between the test and control is seen. This is designated "trace of opalescence." This account is taken from the original description of Nonne and Apelt.

In certain other non-syphilitic affections of the central nervous system, amongst which may be mentioned idiopathic epilepsy, the total albumens were increased whereas Phase I was absent. Phase II, according to Nonne, would not aid in differentiating such affections as epilepsy and brain tumor on the one hand and syphilitic affections on the other, but Phase I was proposed as a means of making this differentiation. In a later publication (10) this author is more reserved in the signification of this reaction, stating however that it is a definite sign of organic disease. Mestrezat (29) believes that the chief importance should be attached to the study of the total protein content.

Noguchi (17)[8] observed in his studies of the syphilitic antibody that this body was contained in or precipitated by the globulin fraction of the fluid and particularly by the euglobulin. These substances were found to be increased with the demonstration of the syphilitic antibody but this parallelism was found to be at times absent. As a rule the presence of globulin was detected earlier than the presence of the antibody. For these reasons Noguchi devised his well known and very delicate test for globulin which he describes as highly characteristic but not absolutely specific for syphilis and which is called the "butyric acid test."

It is often very difficult to decide whether a given reaction is positive or not when globulin is present in small amounts for, as we have seen, globulin is normally present. In our experience there are very few fluids which do not give a positive reaction in the sense of the trace of opalescence of Nonne or a light precipitate with the butyric acid test. I think these difficulties are brought out in the opposite conclusions of Nissl and Nonne, both of whom followed essentially the same methods in precipitating globulin. Nonne emphasizes the importance of using Merck's neutral ammonium salt as he claims the presence of an acid reaction may precipitate albumen also. In order to overcome the difficulty just mentioned of judging an excess of globulin, several investigators have devised methods by which this may be more accurately done (Bisgaard, Kaplan). We have not employed the methods but have held to the methods of Nonne and Noguchi in order to compare our results with those of these authors.

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[8] Butyric acid test of Noguchi.
Cerebro-spinal fluid .... 0.1 to 0.2.
Butyric acid 10 per cent. sol. .... 0.5.
Mix these two solutions and boil for a brief period.
Add normal sodium hydroxide .... 0.1.
Boil again for a few seconds.
The appearance of a floccular or granular precipitate after a time period of not greater than two hours constitutes a positive reaction.

The French school attaches primary importance to the estimation of the total protein. It is not practicable from the standpoint of the time consumed nor in the amount of fluid to be obtained to make accurate quantitative chemical determinations by the methods now in use. Nissl has devised a centrifugal method of estimating the amount of proteins thrown down by Esbach's reagent. This method, which he believes to be sufficiently accurate for clinical purposes, is still in use. In the original method the scale was an arbitrary one and did not correspond to known quantities of protein. Rous and Nonne modified Nissl's method and standardized the amounts of the precipitated proteins by comparison with the Esbach scale used in urinanalysis. Mestrezat has devised a diaphanometric method by comparing the transparency of known quantities of protein precipitated by trichloracetic acid and heat. Sicard, after considerable study of the fluid proteins, has lately given us a new method by means of nitro-nitric acid in the cold. He distinguishes three degrees of intensity of the reaction, the first degree being normal. In a recently published paper (31) dealing with a very interesting phase of the protein question, he has noted that at times there is a decided increase in the proteins while the cells of the fluid are normal or only very slightly increased in number. This condition has been called by Sicard "Dissociation albumino-cytologique." From the observation of a number of such cases he concludes that an abnormal quantity of protein does not necessarily indicate an affection of the spinal meninges or roots as has hitherto been supposed and that an increase in albumen without a corresponding increase in cells leads one to suspect in a spinal condition an extradural compression in the epidural space or in the intervertebral foraminae. Amongst the affections included under such a compression are Pott's disease, neoplasms of the dura, spondylosis rhizomelique, and certain cases of sciatica. We have had occasion to observe a typical example in tumor of the cord which although histologically was found to be a psammona appeared on removal to be an intramedullary growth. Nonne mentions 14 cases of spinal tumor, both extra and intramedullary, in which this condition was present. An examination of the cerebrospinal fluid from this point of view would thus appear to be a very important diagnostic aid in cases of suspected tumor of the cord or its membranes.[4]

Wassermann Reaction in the Cerebrospinal Fluid.—Plaut and Nonne were the first in Germany to investigate the frequency of the positive outcome of the Wassermann test in syphilitic nervous disease by examining a large number of cases. Their experiments led them to the conclusion that the reaction in the blood and the fluid did not necessarily run parallel. Their work has been largely quoted in this country. It is the dictum of the Hamburg school at present that a positive blood Wassermann in a case of nervous disease does not of necessity indicate that the disease in question is syphilitic in nature and to determine this point it is necessary to examine the cerebrospinal fluid also by the complement fixation test. The Wassermann reaction in the blood and fluid taken in connection with the cell count and the globulin reaction are spoken of as the 4 reactions by Nonne. The information derived from the outcome of these tests is most valuable in the differential diagnosis between syphilitic and non-syphilitic affections and even in differentiating the different types of syphilis of the nervous system. Thus in cerebrospinal syphilis—also in tabes according to Nonne— the fluid Wassermann is seldom present, while it is almost constantly present in paresis. In the determinations of the fluid Wassermann the amounts of fluid advised by Wassermann (0.2) have up to recently been strictly adhered to in all published work. Lately however Hauptmann (32) in a very thorough article studied the frequency of the positive Wassermann reaction in the fluid when larger amounts of fluid up to 1.0 c.c. were used. His conclusions are interesting and striking, as he claims that the occurrence of a positive Wassermann reaction in the fluid in itself is sufficient proof that a syphilitic affection is present. This author reports 272 cases in which the analysis of the fluid was made from this standpoint. Using the larger amounts of fluid he found the Wassermann reaction present in 87 per cent. in tabes and in 100 per cent. in cerebrospinal lues. With similar amounts of fluid he has never found a positive reaction in multiple sclerosis, or in tumor of which he reports 7 cases. He thus considers the negative outcome of the reaction of importance. The claims of Hauptmann have not passed unchallenged, and in a rather sharp controversy between Hauptmann and his adherents on the one side and Frenkel-Heiden (33) on the other, the latter opposes the use of large amounts of fluid in the Wassermann test, contending that there must be a limit set as to the quantity of fluid used for, he claims, the positive outcome of the reaction may be only the expression of a general syphilitic infection in which a small amount of the specific substance has filtered into the fluid. He is also opposed to the idea that a positive Wassermann reaction is in itself indicative of a syphilitic nervous affection without accompanying lymphocytosis and increase in protein and states that he has never seen a case of true syphilis of the central nervous system without a lymphocytosis of the fluid. Certainly the claims of Hauptmann need confirmation as the question is one of great importance.

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[4] In our total protein determinations we used the simple boiling test which proved not to be sufficient. From Case 102 we have omitted this test and are making other protein tests not noted here.

The serological tests on the cases I am reporting were made by Dr. Harry R. Oliver, serologist of the Lane Hospital of the Stanford University Medical Department. I wish here to make acknowledgment of his collaboration in this part of the work of this paper. The method employed is the original complement fixation test as published by Wassermann, Neisser and Bruck. The antigen used is an alcoholic extract of a syphilitic fetal liver. The quantity of materials used however are half those in general use, so that in our series 1.0 would correspond to 2.0 as used by Hauptmann and others, and the other dilutions are to be interpreted accordingly. The reaction was tested in 4 different amounts of the fluid, being 0.05, 0.1, 0.5 and 1.0. It will be seen that twice as much fluid was used as the greatest amount used by Hauptmann, also half as much as the smallest amount he used. As stated, 0.1 corresponds to 0.2 in Hauptmann's list.

TABES—26 CASES

CASE 1. C. H. 10536–12. List No. 2. D-n. G. Male aged 50, laborer. Syphilitic infection denied. Complaint: Muscular weakness, difficulty in walking and severe attacks of abdominal pain. Examination: Marked Romberg, pronounced ataxia, absence of the Achilles and the patellar reflexes. Anisocoria but not Argyll-Robertson pupils. Autopsy diagnosis tabes, pneumonia.

Pressure not taken. Globulin —, lymphocytosis —, Wassermann blood —, fluid +.

CASE 2. C. H. 10255–12. List No. 3. B-d-y. J. Male aged 48. Chancre in 1886. Complaint: Numbness in left leg, dizziness and unsteadiness on feet. Examination: Romberg present, Achilles and patellar reflexes absent and hyperesthesia to cold about the trunk. Anisocoria but pupils reacted to light.

Pressure +, globulin +, lymphocytosis +, Wassermann blood +, fluid +.

CASE 3. List No. 13. Inmate of the Relief Home. F-t. P. Male aged 59. Chancre 17 years previously. Complaint: Severe lancinating pains in legs and unsteadiness on feet. Examination: Marked disturbance of the sensibility, Romberg present, Argyll-Robertson pupils and absent knee jerks. Diagnosis verified by autopsy.

Pressure +, globulin +, lymphocytosis +, Wassermann blood —, fluid +.

CASE 4. List No. 19. Inmate of Relief Home. M-y. J. Male aged 50. Chancre (?) at 19 years of age. Complaint: Inability to walk, lancinating pains and incontinence of urine. Examination: Marked ataxia, Argyll-Robertson pupils, great disturbance of the superficial and deep sensibility and absent tendinous reflexes in the lower extremities.

Pressure +, globulin +, lymphocytosis +, Wassermann blood +, fluid +.

CASE 5. C. H. 6499–12. List No. 23. M-n. M. Male aged 48. Chancre 8 years previously. Complaint: Numbness in legs and unsteadiness on feet. Difficulty in urination. Examination: Marked Romberg, absence of the tendinous reflexes in the lower extremities and diminished sensibility to pain in the legs.

Pressure +, globulin +, lymphocytosis +, Wassermann blood —, fluid negative up to 1.0.

CASE 6. C. H. 657–12. List No. 26. S-t-d. M. Male aged 48. History of chancre. Complaint: Failing eye sight and unsteadiness on feet. Examination: Marked optic atrophy, Romberg present, absence of patellar reflexes and pain sense diminished and retarded in the legs.

Pressure +, globulin +, lymphocytosis +, Wassermann blood +, fluid +.

CASE 7. Private records. List No. 27. H-n-w. W. Female aged 45. Infection 16 years previously. Complaint: Headaches, pain in region of back and over body generally. Examination: Abadie's symptom present. Hyperesthetic zone about trunk to cold and hypoesthetic areas about region of nipples to tactile stimuli. Anisocoria. Forme fruste of tabes.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid +.

CASE 8. Private records. List No. 35. P-r-e. J. Female aged 37. No history of infection. Complaint: Difficulty in walking. Examination: Romberg present. Knee jerks only brought

69	G-n. A.	Epilepsy		−	−	−	52	2	+	− − −	− − −	− − −	− − −	− − −	
70	W-n. R.	Tabes	30(?)		+		4,000	88		− − −	+ + +	+ + +	+ + −	− − −	
71	M-s. J.	Cerebro-spinal syphilis	135	+	+	+	60	24	+	− − −	+ + +	+ + +	+ + +	+ − −	
72	R-y. F.	Arterio-sclerotic dementia	220	+	+	+	19	18	+	− − −	− − −	− − −	− − −	− − −	
73	R-n. M.	Amyotrophia spinalis progressiva		+	+	+	436	120	+	+ + +	+ + +	+ + +	Not done	Not done	
74	V-z-o. M.	Spondylarthritis	90	−	+(?)	+(?)	39	2	+	− − −	− − −	− − −	− − −	− − −	
75	K-g. G.	Tabes		−	+	+	62	34	+	+ + +	+ + +	+ + +	+ − −	− − −	
76	S-r. W.	Paresis	200	+(?)	+	+	85	81	−	− − −	− − −	− − −	− − −	− − −	
77	H-h. H.	Hemiplegia	80	+	+	+	17	17	−	− − −	− − −	− − −	− − −	− − −	
78	G-d-e. E.	Apraxia, hemiplegia	320							− − −	− − −	− − −	− − −	− − −	Fluid on withdrawal brownish, no coagulation on standing,

out by reinforcement. Impairment of the deep sensibility but not of the superficial sensibility excepting a hypersensibility to cold about the trunk. Heel jerks absent.

Pressure not increased. Globulin +, lymphocytosis —, Wassermann blood —, fluid +.

Case 9. C. H. 7034–12. List No. 39. O-m-n. B. C. Male aged 43. Chancre 15 years previously. Complaint: Unsteady gait, dizziness and pain described as "rheumatism." Examination: Romberg present, Argyll-Robertson pupils, absent ankle and knee jerks and ataxia present. Marked disturbance of both superficial and deep sensibility.

Pressure +, globulin +, lymphocytosis +, Wassermann blood +, fluid +.

Case 10. C. H. 7948–12. List No. 42. W-d. T. Male aged 57. History of chancre 17 years previously. Complaint: Lancinating pains were the chief complaint. Examination: Achilles tendon reflexes absent, Romberg present, pupils unequal and reacted very sluggishly to light. Abadie's symptom present. Subject disturbance of the sensibility present in paresthesias about the ulnar border of the forearms and hands. No marked disturbance of the objective sensibility superficial or deep.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid +.

Case 11. C. H. 1378–12. List No. 47. M-t-a. K. Japanese male aged 48. Chancre (?) 20 years previously. Complaint: Repeated attacks of severe gastric pain. Examination: Left patellar reflex increased over the right, left Achilles tendon reflex absent, right present. Marked hyperesthesia to cold about the trunk. Forme fruste of tabes with gastric crises.

Pressure not taken. Globulin + (?), lymphocytosis —, Wassermann blood —, fluid —. Fluid positive in larger amounts (0.5).

Case 12. C. H. 7975–12. List No. 48. L-k-e. E. Male aged 31. Chancre 3 years previously. Complaint: Numbness and coldness in left leg. Anisocoria but pupils reacted to light although sluggishly. Right Achilles tendon reflex absent. Right patellar tendon reflex more feeble than the left. Had lancinating pains in the thighs. Forme fruste of tabes.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid +.

Case 13. C. H. 10510–12. List No. 51. R-n. J. Male aged 54. Chancre in 1896. Complaint: Jerking of limbs, trembling of hands and insomnia. Examination: Marked Romberg, patellar and Achilles tendon reflexes absent. Ataxia present in the pointing tests. Superficial sensibility impaired on the dorsum of both feet. Difficulty in holding the urine. Pupils reacted to light and accommodation. No evidence of arteriosclerosis.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid tested only in larger amounts and there found positive (0.5).

CASE 14. C. H. 1264–11. List No. 59. L-h. G. Male aged 41. Infection denied. Complaint: Severe attacks of gastric pain, nausea and vomiting. Examination: Argyll-Robertson pupils. Heteronymous diplopia, left Achilles tendon reflex absent. Great hyperesthesia to cold about the trunk.

Pressure not taken. Globulin +, lymphocytosis +, Wassermann blood +, fluid +.

CASE 15. C. H. 11447–12. List No. 60. F-m-u. F. Japanese male aged 28. Chancre 4 years previously. Complaint: Severe attacks of gastric pain. Examination presented a very emaciated man. Ataxic gait. Tendinous reflexes in the lower extremities absent. Pupils reacted sluggishly to light and were irregular in contour.

Pressure not taken. Globulin +, lymphocytosis +, Wassermann blood +, fluid +.

CASE 16. C. H. 11598–12. List No. 66. J-s-n. P. Male aged 45. Chancre in 1906. Complaint: Lancinating pains, headaches, dizziness. Examination: Tendinous reflexes absent in the lower extremities. Pupils reacted very sluggishly to light. Some swaying with the eyes closed but not to the point of falling. Moderate ataxia finger-nose and heel-knee tests. A band of anesthesia to pain and temperature at D. 6 and 7.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid —. Fluid positive in larger amounts (0.5).

CASE 17. C. H. 11595–12. List No. 70. W-n. R. Male aged 38. No definite history of chancre. Complaint: Unsteadiness on feet, severe lancinating pains in legs. Examination: Argyll-Robertson pupils, Romberg present, absent tendinous reflexes in the lower extremities, great ataxia and sensibility profoundly affected.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid +.

CASE 18. C. H. 14798–13. List No. 75. K-g. G. Male aged 53. Infection at 21 years of age. Complaint: Unsteadiness on feet, feebleness on the left side of body and loss of sensation on the same side. Examination: Romberg present, ataxia, hypotonia of leg muscles. Left pupil was irregular and did not react to light, right pupil reacted sluggishly. Analgesia and thermanesthesia over the entire right half of body and over the opposite side of face—hemianesthesia alternans.

Pressure not taken. Globulin +, lymphocytosis +, Wassermann blood +, fluid —. Fluid in larger amounts positive (0.5).

CASE 19. C. H. 14715–13. List No. 80. M-n. J. Male aged 40. Chancre 14 years previously. Complaint: Difficulty in walking, pain in "kidneys" and double vision. Examination:

Romberg present, tendinous reflexes in the lower extremities absent. Hypersensitive areas on the outer aspects of thighs and legs.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid not tested.

CASE 20. C. H. 13131–12. List No. 84. A-h. J. Male aged 38. History of chancre (?). Complaint: General body pains and headaches. Examination: Both Achilles tendon reflexes absent. Pupils reacted sluggishly to light. Hypoesthesia noted on forehead and over a poorly defined area on the right side of chest. Slight swaying in the Romberg test.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood—, fluid —. Fluid in larger amounts positive (0.5).

CASE 21. C. H. 14009–13. List No. 88. L-n. B. Male aged 38. Denied luetic infection. Complaint: Severe lancinating pain in legs. Examination: Argyll-Robertson pupils. Tendinous reflexes in the lower extremities extremely lively. Temperature sense impaired on the anterior surface of right leg and thigh. Hyperesthetic areas on the outer surface of each thigh. No definite Romberg and no disturbance of the deep sensibility brought out in the examination.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid —. Fluid negative in larger amounts.

CASE 22. C. H. 728. List No. 98. P-t-u. J. Male aged 50. Luetic infection not definitely established from history of case. Referred from the eye clinic with diagnosis of partial oculomotor paralysis on the right side. Examination: Paralysis mentioned above, Argyll-Robertson pupils, absence of the tendinous reflexes in the lower extremity. Slight ataxia in pointing tests and impairment of superficial sensibility.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid +.

CASE 23. C. H. 943. List No. 101. S-y. L. Female aged 53. Infected at 22 years of age. Complaint: Severe attacks of stomach trouble, inability to walk unsupported, pain in back. Examination revealed Argyll-Robertson pupils, definite Romberg, absence of the tendinous reflexes in the lower extremities and disturbance of the superficial and deep sensibility.

Pressure not taken. Globulin +, lymphocytosis +, Wassermann blood +, fluid only tested in the larger amounts and there positive (0.5).

CASE 24. C. H. 777. List No. 104. S-r. F. Male aged 50. Infection at the age of 23. Complaint: Great difficulty in walking, failing vision and muscular weakness. Examination: Advanced tabes—Argyll-Robertson pupils, absent tendinous reflexes in the lower extremities and profound sensory involvement.

Pressure increased. Globulin test not done. Lymphocytosis —, Wassermann blood +, fluid —. Fluid in larger amounts also negative.

Case 25. C. H. 1608. List
65. Chancre (?) at the age of 25
in walking, numbness in the legs
tion. Examination: Tendinous refl
absent, Romberg present, Argyll-R
ataxia in pointing tests and impairm
deep sensibility.

Pressure increased. Globulin +,
mann blood —, fluid +.

Case 26. C. H. 7574–12. List N
47. Chancre (?) at the age of 19 ye
ness on feet, lancinating pains and
Examination: Argyll-Robertson pupils,
absent, external strabismus both eyes
Romberg present, moderate locomotor
to cold about trunk.

Pressure not taken. Globulin +, l
mann blood —, fluid +.

Tabes Dorsali

The following is the formula of Non
results.

Lymphocytosis positive in ca. ....
Wassermann in blood positive in.........
Pressure of fluid .... of
Phase I reaction in ....
Wassermann in fluid:
  (*a*) Original method of Wassermann
    (0.2) positive in ....
  (*b*) With larger amounts of fluid
    positive in ....nearly

Summary.—The percentage of positive
actions by the original method (0.2) is seen
widely from that of Nonne and this differen
accounted for in the difference in the amoun
percentage of blood Wassermann reactions i
per cent. as opposed to 60–70 per cent. in N
rather striking that with the larger amount of
reaction present in 88 per cent. of cases while
approximately the same per cent. (87). The
the percentage of positive Wassermann reacti
inal amounts of fluid higher than Nonne (19 p
be seen that a few of our cases are early for
formes frustes. These were included also in

above named authors. It will be seen that the increase in globulin and cellular elements is the most constant positive finding. We have come to lay great weight on the positive cell count. The first case of this series is, however, interesting in this connection. Clinically it was a fairly well marked case of tabes complicated with gastric crises and marked muscular weakness. Repeated punctures were done on this patient with the constant result of an absence of an increase in globulin or cellular elements. The autopsy showed a well defined posterior column degeneration but no evidence macroscopically of a leptomeningitis. We have not yet made microscopical sections of this specimen. The spinal fluid Wassermann in this case was positive. Cases 11 and 24 of our tabes series present only slight modification in the fluid. In both cases the number of red cells prevented an accurate globulin determination; in the former case the fluid showed a positive Wassermann reaction when the larger amounts were used, in the latter the blood Wassermann was positive. In all these 26 cases we have not found a case in which the examination did not reveal one of the 4 reactions of Nonne, unless case 11 be so considered (0.2 negative). Out of 167 cases of tabes, however, Nonne found 11 cases in which all reactions failed.

CEREBROSPINAL SYPHILIS—7 CASES

CASE 1. C. H. 13360–12. List No. 10. D-h-y. L. Male aged 44. Chancre in 1891. Since 1905 gradually increasing spasticity in legs and corresponding difficulty in walking. Slight involvement of the bladder function and some slight disturbance of the superficial sensibility in the legs. At rest the muscles of the legs do not present the hypertonia usually seen in other cases of spastic paraplegia. Besides the trouble in the legs, the patient presents a perforated nasal septum and an involvement of the cochlear and the vestibular branches of the 8th nerve on both sides.

Pressure not increased. Globulin —, lymphocytosis —, Wassermann blood not made, fluid —. In larger amounts of the fluid positive.

CASE 2. C. H. 6070–12. List No. 21. K-n. M. Female aged 49. History of infection (?) 25 years ago. Complaint: Lancinating pains in right thigh, frequent headaches, photophobia. Examination showed an unsteady gait but no Romberg. The patellar tendon reflexes were present but unequal. External strabismus of the left eye. Hearing much diminished in both ears. The pupils were regular in contour and equal in size and reacted well to light. No anesthesias but a general hypersensibility about the body.

Pressure not increased. Globulin —, lymphocytosis —, Wassermann blood +, fluid —. Fluid negative in larger amounts.

CASE 3. C. H. 10530–12. List No. 46. S-k-a. H. Japanese male aged 32. Chancre 10 months previously. Complaint: Pain in joints, particularly in wrists and ankles, headaches. Examination: Right patellar reflex increased over the left. Nerve deafness (?) on left side. Tongue protruded to the left. No eye symptoms, no ataxia or disturbance of the sensibility noted.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid —. Fluid negative in larger amounts.

CASE 4. C. H. 15277–13. List No. 65. G-s-i. F. Male aged 44. History of a chancre in 1897. Complaint: Irritability of temper, failing vision. Examination: Fundi normal, fields contracted. Patellar and Achilles tendon reflexes are very lively. Walk slightly spastic. Band of anesthesia to light touch from 4 to 8 D. segments. Pupils react sluggishly to light, are slightly irregular in contour and are unequal in size. Marked tremor of the hands. Ataxia present in finger-nose test.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood not made, fluid +.

CASE 5. C. H. 15276–13. List No. 68. H-d-r. L. Male aged 27. Chancre in 1905. Patient presented a left hemiplegia with exaggeration of the tendinous reflexes and inversion of the plantar reflex on the same side. Subjectively patient suffered no pain, but the arm on the affected side was very weak, cold and often cyanotic. An area of hypoalgesia was found on the left side of the body in the area supplied by the 10, 11, 12 dorsal and 1, 2 lumbar segments. There is a facial paresis on the left side. Psychic: No definite dementia, but judgment is impaired and emotional tone is disturbed.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid —. Fluid negative in larger amounts.

CASE 6. C. H. 11894–12. List No. 71. M-s. J. Male aged 47. Chancre 1 year previously. Treated for a period of one year in the Genito-urinary Clinic. Was referred to the Neurological Clinic on account of complaint of a numb dead feeling in the right leg and thigh. An examination showed no abnormality in the state of the reflexes or in the condition of the cranial nerves. In the right lower extremity there were areas of anesthesia (partial) and in these same areas there was a hypersensibility to pain. In the differential count of the cells of the spinal fluid these were found to be almost exclusively small lymphocytes, a finding which Nonne regards as being very distinctive of cerebrospinal lues.

Pressure not increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid +.

CASE 7. C. H. 1466–11. List No. 105. H-g-y. J. Male aged 35. Chancre 8 years ago. Entered the clinic with a typical Brown-Sequard paralysis from a lesion at or above the 11 dorsal segment of the cord on the right side. In addition to this, the patient presented symptoms of an impaired mentality evidenced by poor memory, apathy and errors in simple calculations. Under energetic treatment there was great subsequent improvement in this case both physically and mentally.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid +.

Summary.—The following is the formula of Nonne as compared with our own results:

	Nonne	Our Cases
Pressure	Frequently increased	Same.
Wassermann reaction in blood serum	Present in 80 to 90%	80%
Globulin (Phase I)	Almost constantly present	67% (globulin)
Lymphocytosis	Almost constantly present	71%
Wassermann reaction in fluid:		
(*a*) Original method (0.2)	Positive in 5 to 10%	43%
(*b*) Larger quantities	In nearly 100% positive	57%

It will be recalled that Plaut and Nonne emphasize the low number of positive Wassermann reactions in the fluid in cerebrospinal syphilis when the amounts used correspond to the original method of Wassermann. It will be seen that in our cases this in a general way holds true. The number of our cases is not large; in those cases in which there appears to be very little doubt about the nature of the syphilitic process in question, case 4, brain syphilis of the endarteritic type, and case 7, syphilitic spinal paralysis of Erb, the spinal fluid Wassermann was negative, although in the latter case the Wassermann was positive in the higher amounts of fluid. All of these cases, with the exception of case 1 and case 5, were very much benefited by antisyphilitic treatment. Case 1 falls in that category of syphilitic affections in which it is often very difficult to decide whether we are dealing with a true syphilitic affection or a parasyphilitic one. The length of time which had elapsed since the probable infection seemed to indicate parasyphilis as well as the negative therapeutic result. From a study of the case, however, we incline to the view of a true syphilitic process.

General Paresis—4 cases

Case 1. C. H. 1292–11. List No. 9. M-y. D. Male aged 60. Denied venereal infection. Physical: Argyll-Robertson pupils, marked arteriosclerosis, very lively tendinous reflexes in the lower extremities, unsteadiness of the walk. Marked trembling and unsteadiness of hands. Stumbling and at times explosive speech. Mental: Great defects of memory, outbursts of anger, and alternate periods of elation and depression. No exalted ideas. Great neglect of person.

Pressure not taken. Globulin +, lymphocytosis +, Wassermann blood +, fluid +.

Case 2. C. H. 7985–12. List No. 12. A-n. D. Male aged 28. Denies chancre although admits frequent exposure. Striking history of apoplexy as cause of death in both branches of family. Complains of transitory paralytic seizures which have become more frequent of late. In writing will leave out words and even phrases. Memory failing, great psychomotor activity, irritability. Stumbling speech. Trembling of hands, and marked trembling of tongue on protrusion. No Argyll-Robertson pupils. Arteriosclerosis and beginning arcus senilis. The tendinous reflexes are present but there exists an inequality of the radial and triceps reflexes, the right being increased over the left. No trouble of the objective sensibility so far as could be ascertained.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood +, fluid —. Fluid positive in greater amounts.

Case 3. C. H. 11656–12. List No. 31. B-n. J. Male aged 44. History of chancre obtained but date of this, which was at least 5 years back, was very difficult to obtain. Patient presented typical pigmented and punched-out scars on shins. No evidence of arteriosclerosis from palpation of peripheral arteries. Patient presented the remains of an old hemiplegia (*lt*) dating back two years. Condition at present one of mental deterioration manifested by a progressive dementia and great neglect of person. Incontinence. Asthenia. Argyll-Robertson pupils present. The mental condition was not improved by salvarsan treatment.

Pressure increased. Globulin +, lymphocytosis —, Wassermann blood —, fluid —. Fluid negative in greater amounts.

Case 4. C. H. 5037, Records of City and County Hospital. List No. 76. S-y. W. Male aged 28. History of transient attacks of paralysis since two years. History of chancre 10 years previously. Complained of paralysis of left side of body and difficulty in articulation. Patient apathetic and evidently marked diminution of the mental faculties. No grandiose ideas. Pupils were unequal and reacted sluggishly to light. Left facial paresis. Tongue protruded to left. An examination of the backgrounds of the eyes showed an optic atrophy well established and a disseminated choroiditis typically luetic. The tendinous reflexes of the lower extremity were very lively and increased on the left side. There was evidently a diminution of the superficial sensibility in the legs. This patient was unimproved by energetic antisyphilitic treatment and left the hospital unimproved. Abuse of alcohol denied. No evidence of arteriosclerosis. Incontinence of sphincters.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid —. Fluid negative in greater amounts.

NONNE'S FORMULA IN PARESIS OR TABOPARESIS

Pressure frequently increased.
Wassermann in blood positive in nearly 100 per cent.
Phase I reaction positive in 95 to 100 per cent.
Lymphocytosis in ca. 95 per cent.
Wassermann in fluid:
(*a*) Original method of Wassermann (0.2) positive in 85 to 90 per cent.
(*b*) With larger amounts of fluid positive in nearly 100 per cent.

Summary.—The number of the cases we have to report is altogether too small to form any conclusions. With the exception of the second case they were all terminal conditions but were unfortunately lost to view. It is striking that in cases 3 and 4 the blood and spinal fluid were negative as regards the Wassermann test and negative also in the fluid in the greater amounts. According to Nonne and also Plaut this would speak very strongly against the diagnosis of paresis in these cases.

TUMOR CASES—5 CASES

CASE 1. C. H. 10574–12. List No. 34. T-n. F. Male aged 5. Gliosarcoma of the vermis and both hemispheres of the cerebellum found at autopsy. No evidence of syphilis found clinically or at the post-mortem examination.

Pressure not taken. Globulin +, lymphocytosis —, Wassermann blood —, fluid —. Fluid negative in larger amounts.

CASE 2. C. H. 7174–12. List No. 43. G-te. J. Female aged 18. No history of syphilis or any evidence of syphilis being present clinically. Complaint: Failing eyesight, vertigo and amenorrhea. Her symptoms were most pronounced during the menstrual flow. Examination: Optic atrophy following an optic neuritis and an ataxia cerebellar in type. No disturbance of the sensibility noted. Body outlines and development indicated a condition of infantilism. A radiogram of the skull showed an area of bone absorption in region of dorsum epiphii. Diagnosis: Neighborhood tumor producing dyspituitarism.

Pressure not taken. Globulin +, lymphocytosis —, Wassermann blood —, fluid —. Fluid negative in larger amounts.

CASE 3. C. H. 1629. List No. 82. F-e. H. Female aged 39. No history of syphilis. Progressive paralysis of the lower limbs resulting in complete motor and sensory paralysis below the 1 L. segment. Operation and successful removal of a tumor (psammona) at the level of the 3d and 4th L. segments.

Pressure not increased. Globulin +, lymphocytosis —, Wassermann blood —, fluid —. Fluid negative in larger amounts.

CASE 4. C. H. 199. List No. 95. M-e. C. Male aged 46. History of syphilis. This affection had been thoroughly treated prior to the present trouble, which apparently dated from a trauma three weeks previously. Patient was in a stuporous condition when seen and presented symptoms of an encephalitis. Autopsy revealed an angiosarcoma of the right frontal lobe bordering on and infiltrating the cavity of the lateral ventricle of the same side.

Pressure increased. Globulin +, lymphocytosis +, Wassermann blood —, fluid —. Fluid negative in larger amounts.

CASE 5. C. H. 11556–12. List No. 108. Male aged 20. No history of syphilis. Patient presented the classical signs of intracranial pressure from tumor. An angiosarcoma of the 4th ventricle was discovered at autopsy.

Pressure not taken. Globulin +, lymphocytosis +, Wassermann blood —, fluid —. Fluid negative in larger amounts.

Summary.—In four of these five cases the diagnosis was verified either by operation or at autopsy. It will be seen that the Wassermann reactions in these cases were uniformly negative in the fluid; which has been the experience of the majority of observers in cases of tumor of the central nervous system. Thus Hauptmann reports 7 cases of tumor of the central nervous system in which the fluid was negative in all dilutions. Kaplan and Casamajor (18) report 5 cases of brain tumor and 8 spinal cord tumors in which the Wassermann reaction was negative in both the blood and fluid. These together with our 5 cases would make a total of 25 cases in which the fluid Wassermann was negative in tumor of the central nervous system. It would appear that a negative Wassermann in cases of this type would argue in favor of a non-syphilitic process but on the other hand a positive Wassermann reaction does not necessarily exclude the presence of a tumor (Newmark, Moffitt). In case 4 the fluid was found on analysis to be similar to the fluid commonly met with in paresis, there being a marked protein increase and the cells were increased and of the lymphocytic type for the most part. With the history of previous syphilitic infection the possibility of paresis was entertained but thought improbable from the behavior of the Wassermann reaction in the fluid which was done on two different fluids and in both found negative. At the autopsy the tumor mass had involved the cavity of the lateral ventricle, and the source of the globulin and cell increase in the fluid could in this way be explained. In the case (3) of cord tumor mentioned before in the body of this paper, the globulin reaction was very marked and in striking contrast to the normal cell content.

OTHER AFFECTIONS NOT INCLUDED UNDER THE ABOVE HEADINGS

Multiple sclerosis. Two cases, No. 53, 83. One of these (No. 53) came to autopsy. In both of these cases the fluid was normal.

Combined sclerosis. Four cases, No. 8, 58, 90, 99. Two of these cases came to autopsy, No. 58, 99. These were the subacute forms of the disease described by Russel, Batten and Collier. In the terminal stage they presented mental symptoms which were similar to those found in paresis. In each of these cases there was a marked reduction of Fehling's solution and in three out of the total four cases the globulin was slightly increased. In the subacute forms the pressure was slightly increased. The Wassermann reactions in the blood and fluid were negative.

Syringomyelia. Two cases, No. 5, 50. Number 5 showed a globulin and cellular increase and No. 50 showed a decided increase in pressure. The blood and fluid Wassermann were negative.

Tuberculous meningitis. Two cases, No. 61, 62. Both of these cases presented the usual picture of the globulin increase and the marked cellular increase—over 100 cells per c.mm.

Syphilitic neuro-retinitis. Two cases, No. 1, 94. In both of these cases the fluid was normal with the exception of a positive Wassermann reaction in one of them.

Uremia. Two cases, No. 100, 102. Normal fluids with the exception of a marked reduction of Fehling's solution and an increase in pressure.

In the following diseases the fluid was found to be normal with the occasional exception of an increase in the fluid pressure: Neurasthenia (5 cases), paraplegia, hysteria, Meniere's disease, paralysis agitans, acute bulbar paralysis, hemiplegia dolorosa, primary optic atrophy, tinnitus aurium, radiculitis, aphasia, hemianiopsia, polyneuritis, alcoholic, osteomyelitis of the spine, epilepsy, spondylarthritis, osteitis deformans (Paget's disease), cephalgia, melancholia, periodical paralysis, sciatica.

Discussion.—We have come to attach a great importance to the information gotten from the analysis of the cerebrospinal fluid in all cases of nervous disease in which the diagnosis appears in doubt. In fact a neurological examination can not be said to be complete without the aid that this procedure affords. In our series it was exceptional that the clinical findings were at variance with the laboratory findings. This occurred in the two cases of of paresis mentioned above, in a case of pes planus (79) and in one case of progressive muscular spinal atrophy (73). In regard to the pressure of the fluid, the globulin and cell content, our experience does not differ materially from the experience of the Hamburg school. We believe, however, that even in cases of chronic meningeal inflammation, of which the syphilitic process is a type, that the estimation of the total protein is of value. Six cells per c.mm. appears the upper limit of normal. The Wassermann reaction in the fluid is highly characteristic of a process of syphilitic origin and generally speaking is of greater significance than the blood Wassermann when it is desired to establish the nature of a given nervous disorder. We agree with Hauptmann that the positive Wassermann reaction in the larger amounts of fluid is also very characteristic of nervous syphilis. We have no case in our series in which the clinical evidence was against the assumption of a syphilitic affection where the fluid was negative in the smaller amounts and positive in the larger amounts. In our series of tabes cases we found the Wassermann reaction to be more frequently positive in the fluid than in the blood. This is opposed to the later view of Nonne but is in accord with the opinion of most observers. In cerebrospinal syphilis the reaction occurred more often in the blood than in the fluid. This is in accord with the original experiences of Nonne who thus sought to establish a differential point between the true syphilitic and the parasyphilitic affections, which opinion he has later modified from his experience in tabes.

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PIBLOKTO OR HYSTERIA AMONG PEARY'S ESKIMOS[1]

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While reading Admiral Peary's fascinating book "The North Pole,"[2] I was especially interested in his description of what he calls a peculiar form of nervous affection found among the Eskimos, of the western coast of Greenland from Cape York to Etah, which they call piblokto, and which he designates as a form of hysteria. Peary states that he has never known a child to have piblokto, but that some one among the adult Eskimos would have an attack every day or two, and that one day there were five cases. He also informs us that the immediate cause of this affection is hard to trace, though "sometimes" (I am quoting his words) "it seems to be the result of a brooding over absent or dead relatives, or a fear of the future."

Concerning the attack proper he speaks as follows: "The patient, usually a woman, begins to scream and to tear off and destroy her clothing. If on the ship, she will walk up and down the deck, screaming and gesticulating, and generally in a state of nudity, though the thermometer may be in the minus forties. As the intensity of the attack increases she will sometimes leap over the rail upon the ice, running perhaps half a mile. The attack may last a few minutes, an hour, or even more, and some sufferers become so wild that they would continue running about on the ice perfectly naked until they froze to death if they were not forcibly brought back." He goes on to say that when the attack takes place indoors nobody pays much attention unless the sufferer should reach for a knife or attempt to injure someone. The attack usually ends in a fit of weeping, and when the patient quiets down, the eyes are bloodshot, the pulse high, and the whole body trembles for an hour or so afterwards."

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[1] Read before the New York Neurological Society, June 3, 1913.

[2] Pp. 166–167, Fred'k Stokes, 1910.

When I read these interesting statements of Admiral Peary I realized that they represented only a few general observations about a subject which to say much was only of secondary interest to the writer. I therefore expressed the inner wish to know more about this neurotic manifestation, thinking that it might throw some light on our modern problems of the psychoneuroses. My wish was gratified a few weeks ago when I had the pleasure of meeting Prof. Donald B. MacMillan who was one of Admiral Peary's trusted lieutenants during the successful quest of the North Pole in 1908–1909. A natural born anthropologist, Professor MacMillan utilized every opportunity to study these primitive people and his observations and deductions concerning piblokto are therefore very interesting.

I asked Professor MacMillan to tell me something about piblokto, and he described the attack as follows: "A woman will be heard softly singing and accompanying herself by striking the fist of one hand with the palm of the second, making three sounds, one long followed by two short ones. The rhythm and motion continues to increase for some time, during which she usually tears off her clothing, and ends in a fit of crying or screaming in which the woman may imitate the cry of some familiar animal or bird. No two women act alike; there is a certain individuality to every attack. Some drop down on their hands and knees and crawl around barking like a dog. One woman used to lie on her back on the snow and place some ice on her breasts. Some jump into the water and wade among the ice cakes, all the time singing and yelling. Others wander away from the houses into the hills, beating their hands as if demented."

As further illustrations of the individuality of the attacks, Professor MacMillan cited the following cases: (1) "Inahloo, a woman of 45 years, was very violent during her attacks. She did not know what she was doing, she appeared crazy and demented, and would bite when an attempt was made to restrain her." Her specialty was to imitate the call of birds and to try to walk on the ceiling. She also put ice on her chest. (2) Whenever Elkiahsha, nicknamed Bill, had an attack she would walk around the deck of the *Roosevelt* and pick up everything lying loose and throw it up in the air. She also climbed up the rigging and foresheet and stuck her head under the sail. (3) Inahwaho showed her attack by walking on the ice, singing and beating her hands together. (4) Alnaha, nicknamed Buster, 25 years old, was the only woman who jumped into the water during her attacks.

The attacks last from about one to one and a half hours, and usually end in sobbing or in falling asleep, from which they awaken in a perfectly normal state. These attacks reminded me of the running amok among Malays which is usually ascribed to epilepsy[8] and I therefore tried to ascertain whether the attacks were accompanied by a loss of consciousness. Professor MacMillan was certain that all of them showed a loss of consciousness; he thought they were all in a confused state. Thus they were perfectly harmless when left to themselves, but showed a blind resistance if prevented from following out their various vagaries. He was sure that at least one of them, Inahloo, was totally unconscious of her surroundings,—to put it in his own words: "She never knew what she was doing, she was crazy." He distinctly recalls that her face was very congested, her eyes were bloodshot during the attacks, and that she foamed at the mouth. On the other hand he was also convinced that some of them sometimes feign an attack as is shown by the following incident. He was told that Inawaho was running around on the ice having an attack. He got his camera and went out to take some pictures of her while in this state. He saw her running on the ice and beating her hands, but as soon as she noticed him her whole attitude changed, she became very excited, grabbing big chunks of ice and hurling them at him. The following day she told him that she did not have piblokto, that she was only shamming, and asked him not to use her pictures because she was naked. Whether or not she was fully conscious during the attack is difficult to say. Professor MacMillan is sure, however, with this exception the other attacks in Inawaho and in all the others were accompanied by some loss of consciousness. Granting this it would not simplify matters as regards diagnosis. Loss of consciousness may be a concomitant symptom of hysterical or epileptic attacks. My only reason for suspecting the latter is the case of Inahloo whose attacks—congestion of head and bloodshot eyes, foaming from the mouth, loss of consciousness, and violent resistances—would indicate that malady. I was trying to ascertain whether any of those afflicted ever showed a typical *grand mal* attack, but Professor MacMillan had not seen any. We may be sure that it does not exist, otherwise it would not have escaped the notice of so competent an observer as Admiral Peary, who spent about twenty years among these people and has an intimate knowledge of every member of the tribe. On the other hand everything points to hysteria. The disease is almost exclusively confined to the female sex. Professor MacMillan quotes Peary as saying that in twenty years he saw only one man who had what was thought to be piblokto. As cited above Admiral Peary never knew a child to have piblokto. Of the twenty women aboard the *Roosevelt* eight had piblokto. This concurs with the relative frequency of hysteria among civilized people, where female hysteria is by far the most prevalent. And last but not least, the etiology, too, points to hysteria.

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[8] Kiernan maintains that the running amok of the Malay is a form of *furor sexualis*. See Lydston, "Diseases of Society," p. 397.

The Eskimos themselves think that the disease has something to do with the evil spirit, and for that reason they are reluctant to touch the afflicted one during the attack. When an Eskimo woman wanders away while in such state two women follow her, one on each side, and gently push her in the right direction. This conception, as you see, is not so different from the early theories entertained regarding mental afflictions among Europeans. The only probable cause of this affection mentioned by Admiral Peary is of a psychogenetic nature. He says, "The immediate cause of this affection is hard to trace, though sometimes it seems to be the result of a brooding over absent or dead relatives, or a fear of the future." In other words, in the ultimate analysis it is love and hunger. I asked Professor MacMillan whether he formed any idea as to the causation of this malady, and his answer was as follows: "I believe that the attacks are caused by abuse. Most of the Eskimo women who had this disease were of a jealous disposition. They either imagined themselves ill treated or they actually suffered abuse at the hands of their husbands, who often beat them with their fists. Many Eskimos are cruel to their wives." Speaking of the attack he said: "It reminded me of a little child discouraged and unhappy because it imagines that no one loves it or cares for it and therefore runs away." This excellent description from a man who is just an observer and who has never read anything on nervous or mental diseases is most interesting, to say the least. Professor MacMillan described in untechnical language the etiology of hysteria as promulgated from the time of Hyppocrates to our present day. As a further corroboration of his theory he mentioned the case of Alnaha. She was twenty-five years old and the only unmarried woman in the north. Eskimo girls marry at a very early age, usually at the age of twelve years, but no one wanted Alnaha, not because she had no charms but because she was a very poor seamstress. She had more attacks than any one else. He also witnessed an attack of piblokto in an Eskimo woman immediately following a rebuff by a white man who first showed her some favor.

This plainly shows that just as in civilized people it is love that plays the great part in the causation of the malady. It is also interesting to note that it is not the lack of the gross sexual, but the ungratified desire for love that is the determining factor. None of the women mentioned lacked the gross sexual. Alnaha, because single, was common property. *Apropos* it may be mentioned that the Eskimos may be called an unmoral people in our sense. The woman is as much a part of the man's property as his dog and sledge. They indulge in trial marriage and when things do not run smoothly they try again and again. By mutual consent wives are often exchanged between friends. Divorces are very simple. If a man grows tired of his wife he simply tells her there is not room for her in his igloo.[4] Under such conditions it is readily comprehensible that whereas the men fully gratify their sexual impulses the women may never experience those elements of love so essential to feminine nature. In this respect I wish to mention that Professor MacMillan definitely asserts that the Eskimo woman is just as capable of loving as a civilized woman. He related to me many incidents as well as discussions with Eskimo women which convinced me of the truth of his assertions.

In fine we may say that the greatest determinant of piblokto is sex in all its broad ramifications. This, too, corresponds with our psychanalytic experiences gained among our own women, where contrary to the prevailing opinion of some the gross sexual does not necessarily play the great rôle in the determination of the hysterical symptom.

Those who are acquainted with the etiology of the neuroses as

[4] Cf. Peary, *l. c.*, Chap. VI.

formulated by Freud will also understand the almost entire absence of any hysterical manifestations among the male Eskimos.

As far as my inquiries went I could not find any conversion hysterias among these people. The question may therefore be asked why one does not also find in those suffering from piblokto the phenomena of conversion. To answer this question we will have to bear in mind the nature and mechanism of conversion. My experience with such hysterias has taught me that in all cases of lasting conversions, such as astasia abasias, paralyses, aphonias, etc., I always dealt with persons of very complex psychic organizations who were usually suffering for a long time before the conversion took place. Almost all of them belonged to that class of patients who suffer in silence without letting any one know about it. I also recall a great many patients who belonged to the talkative kind who showed their attacks through laughing, crying, and screaming. They did not show as complex a mental organization as the former patients. It is also significant that one rarely encounters conversion hysterias in children. All cases of hysteria that I have seen among children belonged to the anxiety hysteria types. Moreover, when we enter into the deeper mechanism of conversion we know that the symptom like the dream is a concealed expression of a repressed wish. Those who are acquainted with dream analysis are aware that whereas the dreams of adults show hidden symbolized wishes, children's dreams are always quite transparent. Children have not yet learned to suppress or repress, they may wish anything not knowing that it is unattainable and cry when they cannot get it. In other words the dreams like hysterical manifestations among children and adults of a lower type are not as complicated and hidden as those of grownup and intelligent adults.[5] To use psychological terms it may be said that there is no definite line of demarcation between conscious and unconscious, and hence the psychic elaboration and subsequent motor reactions are quite superficial. They may evince themselves in crying spells, laughing spells, screaming spells, or some other simple manifestations. Peary says: "Eskimos are children in their grief, as in their pleasure." Their motor reactions to unattainable wishes are also childlike. Instead of a complicated hysterical attack or a chronic hysterical symptom like paralysis or aphonia, the attack usually follows the injury and manifests itself in an emotional outburst of the most primitive type. There is hardly anything more childish than the imitation of the dog or bird, or the running away into the hills singing or crying. And yet is there really so much difference between the hysterical mechanisms as evidenced in piblokto and the *grande hysterie* or other modern hysterical manifestations? We may answer unhesitatingly that the difference is more apparent than real. The deeper determinants as we have seen are the same in both. With due apologies to Mr. Kipling we may say that the modern lady and Eskimo Julia O'Grady are the same under the skin.

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[5] Freud: "The Interpretation of Dreams," p. 107. The Macmillan Co., N. Y.

TRIGEMINAL DURAL NEURALGIA

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One frequently hears it said that headache is only a symptom and deserves no further classification, but one is hardly justified in including conditions like migraine and indurative headache under such a generalization. In truth the study of head pain in its various forms has been much neglected by the profession at large because of this tendency toward generalization and also because of the all too common use of the coal tar preparations to obtain temporary relief. The writer has observed in the last five years a type or variety of head pain, neuralgic in character, yielding but slightly to the usual analgesics, having more or less distinct manifestations and due, in his opinion, to neuralgia in the dural branches of the fifth nerve, just as tic douloureux, with which it is at times associated, is due to neuralgia in its peripheral branches. For this condition he has selected the name of trigeminal dural neuralgia.

The dural branches of the trigeminal nerve spring from the Gasserian ganglion, the sensory roots or the nerve trunks themselves. Dana in his text-book gives the dural distribution of the fifth nerve as follows: "It gives sensation to the anterior three fourths of the dura mater, the falx and probably the tentorium. The pia and anachnoid are not sensitive. The posterior fossa and the occipital part of the dura mater are supplied by the vagus. The trigeminus also supplies the above named parts with trophic, vasomotor and secretory fibers." As the brain is itself insensitive then intracranial head pain is due to involvement of the sensory nerves of the dura.

After quite an extensive review of the literature, the writer has been unable to find the description of a neuralgia confined to, or especially involving, the dural distribution of the fifth nerve. He believes such a condition exists and is somewhat similar to and sometimes, but by no means always, connected with trifacial neuralgia.

The cause of trigeminal dural neuralgia seems to be the same as in trifacial neuralgia, which is usually constitutional. These causes are most frequently malaria, rheumatism, diabetes, anemia, syphilis, arteriosclerosis and sometimes other general disturbances.

It is needless to say that the cause should be most diligently searched for and as far as possible corrected, for in this lies the hope of the relief of the neuralgia. The pathology like that of trifacial neuralgia is probably scant. We only know that in trifacial cases there have been found some cell changes in the Gasserian ganglion and sometimes evidence of arteriosclerosis in the arteries supplying the nerves.

The nature of trigeminal dural neuralgia is that it occurs in attacks of sharp, intense pain of irregular periodicity, that nausea, vomiting, flashes of light and familial tendency are not prominent features, that the pain as a rule is unilateral and may radiate to the face, neck or shoulders, that the pain does not yield to the usual headache remedies, that vasomotor and trophic disturbances are common, that this head pain cannot be traced to the usual causes of headache producing changes in cerebral circulation, but that it appears to be due to chronic systemic diseases like chronic rheumatism, chronic malaria or arteriosclerosis, and that remedial medication directed toward the conditions just named usually cures the dural neuralgia.

The writer presents the following cases. Others have been observed, but not having this condition particularly in mind, the notes are not full enough to justify their publication.

We observe that most of these patients are in middle life, that an hereditary factor is practically absent, that the pain is sharp and intense, that the supposed cause is a chronic constitutional condition, that exciting causes are variable, that radiating pains, tic douloureux and vasomotor disturbance are of common concomitance, that these headaches have extended over periods of from eight months to twenty years, that in frequency they vary from a few days to a few weeks and are of irregular periodicity, that the attacks themselves last from a few hours to several days, that the pain is usually unilateral, that previous treatment has at best had only temporary effect and that these cases yielded to specific medication directed to the underlying cause.

No.	Sex	Age	Family History of Headache	Character of Pain	Previous Diseases	Supposed Cause	Exciting Cause	Complications	Time Affected	Location	Frequency	Duration of Attacks	Previous Treatment	Medication Given	Result
1	M.	37	None	Intense. Cannot lie down. Worse in evening	Rheumatism	Rheumatism	Unknown	Pain in left shoulder	17 yrs.	Left side of head	Once a week	10 to 12 hours	Usual analgesics and morphia	Sodium salicylate and quinine	Cured. Heard from him 3 months after, no return
2	F.	25	1 aunt migraine	Intense and sharp	Rheumatism	Rheumatism	Unknown	Red spots on face, nervousness	7 yrs.	Right side of head	Every week or two	Few hrs. to a day	Morphia, blisters, usual analgesics	Sodium, salicylate and sodium bicarbonate	Improved, but lost track of
3	M.	29	None	Intense and sharp	Rheumatism and tic douloureux	Rheumatism	Cold weather and intense heat	Tic douloureux	8 mos.	Left side of head	Constant discomfort, acute exacerbations	Several hrs.	Refraction, opium, usual analgesics	Sodium salicylate and sodium bicarbonate	Cured, no return after six months
4	F.	31	None	Intense and sharp	Pneumonia 11 years ago. Anemia	Anemia. 3,000,000 red cells	Fatigue, fright	Nervousness, pain in right eye	4 yrs.	Right side head	Every few weeks	36 hrs.	Usual analgesics, cocaine	Iron and arsenic	Cured
5	F.	58	None	Intense and sharp	Puerperal fever 23 yrs. ago. Rheumatism	Rheumatism, malaria	Unknown	Tic douloureux	1 yr.	Right side head	Every few weeks	Few hrs. to days	Usual analgesics	Quinine, sodium salicylate	Cured, after year no return

No.	Sex	Age	Family History of Headache	Character of Pain	Previous Diseases	Supposed Cause	Exciting Cause	Complications	Time Affected	Location	Frequency	Duration of Attacks	Previous Treatment	Medication Given	Results
6	M.	30	Father rheumatism and headache	Intense and sharp	Syphilis 11 yrs. ago. Rheumatism	Rheumatism	Unknown	Sweating at vertex, soreness of ears, jaws, back of neck	2 yrs.	Bilateral, temporal	Every 2 or 3 months	3 days to a week	Refraction, anti-syphilitic, usual analgesics	Sodium salicylate	Cured. No return for 2 yrs., then few stopped by same medicine
7	M.	57	None	Intense and sharp	Malaria 16 years previous	Arteriosclerosis. B. P. only 140	Heat, worry, fatigue	Eyes suffused, sweating right side head and face	20 yrs.	Right side of head	Once or twice a month to 4 or 5 days	5 to 20 hrs.	Refraction, usual analgesics	K. I. small doses, spts glonoin	Cured, mo. return 8 mos. to date
8	M.	37	None	Intense and sharp	Appendicitis. Rheumatism	Rheumatism	Over-eating, damp weather	Nervousness	Over 1 yr.	Not recorded	Twice a week	5 or 6 hrs.	Refraction, acetanilid, morphia	Sodium salicylate, sodium phosphate	Greatly improved. Only 2 slight attacks in 3 mos.
9	F.	40	None	Intense and sharp	Recent malaria	Malaria	Improper eating, damp weather	Left temporal veins swell, vomits occasionally	3 yrs.	Left side head	2 or 3 times month	1 or 2 days	Usual analgesics, morphia	Quinine and arsenic, plasmodium found	Cured, no return 3 months to date

Reviewing these facts and recalling the distribution of the dural branches of the trigeminus, the writer believes one is justified in separating as a variety this form of head pain from migraine, acute toxic, superficial neuralgic, increased pressure headaches and others and in giving this type the name of trigeminal dural neuralgia.

Society Proceedings

PHILADELPHIA NEUROLOGICAL SOCIETY

March 28, 1913

The President, Dr. George E. Price, in the Chair

DIFFUSE NEURO-FIBROMATOSIS RECKLINGHAUSEN'S DISEASE

By Alfred Gordon, M.D.

Dr. Gordon presented a man, aged 28 years, photographer by occupation, who observed at the age of five, small tumors first on his arms. Gradually the disease progressed. At present the man is literally covered with masses of various sizes. Face, thorax, abdomen, arms and legs, also scalp and scrotum are covered with these tumors. Some of them are semisolid, others very soft. They are all sessile. Some of them are moderately painful, others very painful. Some of them are located deep in the subcutaneous tissue, others more superficially. Those that are situated on the ulnar nerves at the elbows are particularly painful. Some of the tumors resemble the plexiform variety of neuro-fibromata described by Verneuil, viz., tortuous bunches of nerve fibers matted together by fatty tissue.

The patient presents also some pigmentation of the skin. He does not show symptoms of involvement of cranial nerves. However, not infrequently, he complains of headache. Mentally he shows some depression, although his psychic functions so far present nothing abnormal.

Reflexes, station, gait, are all normal. Not infrequently he is obliged to go to bed because he feels indisposed in a very vague manner; nothing definite is complained of at that time.

He has visited almost every large city of Europe and consulted some eminent men. Radium was advised, but it produced some burns and did not relieve him. The case is quite unusual in view of the extent of the areas involved.

BILATERAL EXTERNAL RECTUS PARALYSIS, DUE TO TRAUMATISM

By Edward A. Shumway, M.D.

Dr. Shumway (by invitation) reported a case of bilateral paralysis of the external rectus muscle, in a healthy man, 40 years of age, which resulted from a fall upon the head from a wagon. The man had gone to a nearby hospital, and was treated for hemorrhage from the right ear, and had then returned to the city by trolley. Shortly before reaching home, about two hours after the accident, he became nauseated, and vomited blood, but did not lose consciousness at any time. On the following morning, he complained of diplopia, and one week later was seen for the first time by Dr. Shumway, who found complete paralysis of both external rectus muscles, and left facial paresis. The Wassermann test was negative, there were no eyeground changes, vision was unaffected, and the visual fields were normal. Iodide of potassium was given, and the facial paresis gradually disappeared. At the time of the report, four weeks subsequent to the accident, both eyes were commencing to move outward, and the patient complained very little of diplopia. Dr. Shumway discussed the situation of the lesion in external rectus paralysis, and referred to the post-mortem findings in a number of cases, which had been due to traumatism to the skull. In the majority of instances the lesion has been extranuclear, and the result of fracture of the base of the skull, with laceration or stretching of the nerves; at times there has been pressure from hemorrhage, occurring at the time of accident, or secondarily from exudate or callus formation. In his case he thought there had been a fracture of the base, of moderate severity, as shown by the bleeding from the ear, and into the pharynx, and he considered the paralyses due to pressure upon the trunks of the sixth and the facial nerves, after their emergence from the dura, at the lower border of the pons, where they are in close association. Prognosis in such cases depended upon the lesion present. If the nerve trunks were lacerated, paralysis would be permanent; if there were compression by hemorrhage, function would probably be restored, and absorption of the blood should be hastened by the administration of iodides.

Dr. H. Maxwell Langdon said that he had seen a very similar case. A physician from one of the southern states where he was the medical man for that section of one of the railroads, while riding on an open handcar at night, had been knocked from the car by a bough of a tree hanging over the track, and rendered unconscious for twenty-four hours. When he recovered consciousness he was found to have diplopia, and remained flighty for some time. His knee jerks were subnormal and it was believed that he probably had locomotor ataxia, though the neurological examination was otherwise negative.

He was sent to Dr. Mitchell and was in the Orthopedic Hospital for some time. His mind was still not entirely clear. Ocular examination showed a complete paralysis of both external recti, without involvement of other ocular structures, though at one examination there seemed a slight weakness of one superior rectus, but at no other time was this elicited. There were no changes in central or peripheral vision and the fundi were healthy. He made a complete recovery as far as his mental condition was concerned, and returned to his practice, but the ocular paralysis was unaltered. It was thought that the lesion was nuclear, catching both six nerve nuclei.

Dr. W. B. Cadwalader said that the possibility of tabes was considered in the case Dr. Langdon spoke of, but the Wassermann reaction was negative. It was purely a traumatic case in all probability.

Dr. S. Leopold said he had had experience with a woman who fell down the cellar steps and a little later—several weeks—developed a paralysis of the trochlear nerve. The Wassermann was negative, so he supposed this was a case of nuclear paralysis.

BILATERAL PARTIAL PARALYSIS OF THE THIRD AND SIXTH NERVES WITH OPTIC ATROPHY

Dr. H. Maxwell Langdon read this paper.

Dr. William G. Spiller said that he should be inclined to regard the case as probably one of tabes; the positive Wassermann, the patellar reflex lost on one side, diminished on the other, the slight ataxia, increased micturition, and ocular palsies, he should regard as tabetic. Dr. Spiller said he was studying, at the present time, a case of tabes in which the ocular muscles had been greatly paralyzed. There were very few cells in the oculo-motor nucleus in this case, and all the ocular nerves were very small.

TABES DORSALIS

By H. Maxwell Langdon, M.D.

B. B., aged 47, in 1892 had a chancre. In 1900 first noticed diplopia, which has persisted ever since. Now shows lost knee jerks, slightly swaying station, with eyes closed. Babinski on right side. Somewhat lessened sexual power. Wassermann and Noguchi both positive.

O. D. V. 5/10, O. S. V. 5/10. Palpebral fissures each 9 mm., pupils each 2.5 mm., slight but prompt reactions to light and distance. O. D.: Outward rotation very slight, upward lessened, inward and downward normal. O. S.: Outward rotation very slight, upward lost, downward lessened, and inward normal.

The media are clear, the discs quite gray, with no other fundus changes. The form fields are normal, but the color fields are concentrically contracted.

The interesting features were the extensive involvement of the extra-ocular muscles, with good pupillary reactions and very slight involvement of the optic nerves. Both external recti were quite out of commission, and many muscles supplied by the oculomotor nerves were also affected. On attempt to rotate the eyeballs there was usually a spasm of the unopposed internal recti, producing a strong convergence.

Dr. Cadwalader said that one symptom that this man seemed to have had interested him very much. That was polyuria. He thought it might indicate involvement of the posterior lobe of the pituitary gland. The patient is undoubtedly syphilitic.

Dr. S. Leopold said he had a case under observation at the present time which was interesting from the fact that the man has paralysis of all the muscles that this man showed, with knee jerk lost on one side, and diminished on the other. The interesting part is that now he is beginning to show optic atrophy.

BILATERAL FACIAL PARALYSIS OF PERIPHERAL ORIGIN

By John H. W. Rhein, M.D.

Dr. Rhein reported a case of a young woman of 20 years of age who on January 4, 1913, suddenly was seized with pain over the left eyebrow and double vision. Examination by Dr. William Campbell Posey showed paralysis of the superior, inferior and internal recti muscles. There was no involvement of the iris or ciliary muscles. The fields of vision were normal for form and color. An x-ray of the orbit and examination of the sinuses proved to be negative. Considerable improvement followed in the paralysis of the ocular muscles and on February 24, the patient suddenly developed left-sided facial paralysis. Four days later the right side of the face became paralyzed and for the latter condition she applied for treatment at the Philadelphia Polyclinic Hospital, where she came under his care. Outside of the fact that her father had died of diabetes and that she had had scarlet fever in childhood the family and previous histories were entirely negative. It is to be noted that the paralysis on the ocular muscles as well as the facial palsies were accompanied by painful manifestations in the region of the orbit and face. When she applied to the Philadelphia Polyclinic on February 26 the ocular palsies had disappeared completely. Her present condition is as follows: There is complete paralysis of both sides of the face in the upper and lower distributions of the face, and the sense of taste is lost in the anterior two thirds of the tongue on both sides. Sensation on both sides of the face is undisturbed. The dynamometer test shows that the grasp is good on both sides, her station is good, the knee jerks are increased and equal on both sides. There is an old retracted ear drum on the left side, dating from the attack of scarlet fever in childhood. Otherwise the ear examination is negative. Electrical examination shows reactions of degeneration and diminished faradic response. Evidences of disease of the pons of the medulla are lacking. There is no evidence of a previously existing infectious disease to account for the symptoms. There is no history which would indicate a toxic origin and a repeated negative Wassermann reaction excludes what would appear to be the most probable cause of the symptoms, namely syphilis. Dr. Rhein believed that the cause of the ocular motor palsies as well as the facial diplegia is due to refrigeration. The patient works constantly beside an open window and is exposed to a draught. The ocular motor palsies are, as is known, infrequently caused by cold or rheumatism.

A CASE OF DYSTONIA MUSCULORUM DEFORMANS

By William G. Spiller, M.D.

The patient was a man of middle age who had been many years in the Philadelphia General Hospital. Two of his sisters had been in the same institution and had died there. All three were of feeble mental development, and so far as known were not of Jewish blood. One of the sisters was recorded as having "chorea," the other had choreiform movements and walked with a peculiar swinging gait and every now and then a shrug of the shoulder. Her movements were irregular and clumsy and much like those of her brother. She had delusions.

The man had no muscular palsy. The condition had been called tic, or Huntington's chorea. Dr. Spiller had never been satisfied with either diagnosis and regarded the movements as constituting a distinct type of disease. In conversation with Dr. Patrick the latter without examining the patient had referred to Oppenheim's recent paper on dystonia. Dr. Spiller had studied the case with this possibility in mind, and had come to the conclusion that the case was one of dystonia musculorum deformans. The occurrence of the disorder in three members of a family, the feeble mentality, and the absence of Jewish blood made these cases remarkable.

When the man was lying in bed the right hip was higher than the left and the right hip was inverted, and each foot was in the position of talipes equino-varus.

Passive movements at each hip were restricted because of the spastic condition of the muscles about the hip. The lower limbs also were spastic and passive movement at the knee on each side was very much impaired. The toxicity of the muscles of the feet varied constantly so that occasionally the feet were partially everted; more frequently they were inverted. The whole body was poorly developed but there were no local atrophies. If the knee was supported by the hand of the examiner it was difficult to secure sufficient relaxation to test the patellar reflex. Any handling of the lower limbs caused marked increase of tonicity with irregular movements, and yet these involuntary movements were not typically athetoid. The patellar and Achilles reflexes on each side were exaggerated. The lower limbs were much more affected than the upper limbs.

When standing the body inclined distinctly to the left and forward, so that the right hip was considerably higher than the left hip. The man had much difficulty in rising from a sitting position.

There was a backward curvature of the spine when the man was sitting in bed. The gait was extraordinary, he put his feet down firmly so as to stamp, he lifted the knees unusually high, and all movements of the lower limbs were exceedingly incoördinate, and the trunk inclined forward at the hips. The upper limbs were thrown into awkward positions while walking, often being placed behind the body. He could touch the finger of either hand to the end of the nose, but these movements were distinctly incoördinate, and yet much less so than those of the lower limbs. Sensations for touch and pain were normal in all parts of the body.

The same condition of increased tonicity on passive movements that was observed in lower limbs was also observed in the upper limbs. The biceps jerk was a little exaggerated on each side. The triceps jerk was more difficult to obtain.

There was a considerable degree of spasticity also in the muscles of the face.

Dr. J. W. McConnell said that Dr. Spiller deserved a vote of thanks from the Society for having taken up the subject and threshed out the precise diagnosis in a case that has been the subject of so much comment. The case had been diagnosed as cerebral diplegia, as Huntington's chorea, and many other conditions. Dr. McConnell thought that all those who had anything to do with the wards of Blockley would appreciate Dr. Spiller spending so much time on this very abstruse case and giving us some idea of what he believes is the disorder.

Dr. Spiller called attention to the fact that when the patient was sitting he was quiet. There were no athetoid movements, such as would be present in Huntington's chorea or tic. This is characteristic of dystonia. It is only when the muscles are used that the movements of distortion appear. We think of the basal ganglia in all cases of peculiar movements of a choreiform or athetoid type.

Dr. F. X. Dercum said Dr. Spiller would doubtless recall a case they had both seen that was thought to be one of multiple sclerosis, but when it came to autopsy at Dr. Spiller's hands, the case was found to be malaria of the nervous system. Dr. Spiller subsequently published the case.

THREE CASES OF INTENTION TREMOR AND JERKING SPEECH PROBABLY CAUSED BY ALCOHOLISM

By William G. Spiller, M.D.

Dr. Spiller said he presented these cases because he had known similar cases to be regarded as examples of multiple sclerosis. The tremor was distinctly of an intention variety and the speech was like that observed in multiple sclerosis. Other symptoms of this disease were not present. All three men had used alcohol excessively. These symptoms are not sufficient to warrant a diagnosis of multiple sclerosis. Dr. Spiller had studied two cases with the symptoms mentioned which had been regarded by many as undoubted examples of multiple sclerosis; one was found to be a case of cerebrospinal syphilis, the other one of cerebrospinal arteriosclerosis.

Dr. J. Hendrie Lloyd thought the patients had a very wide intention tremor of a type not unusual in chronic alcoholism. He spoke of an instance of extraordinary alcoholic tremor which had occurred at Blockley. There were two brothers affected with the tremor. One of them, he thought, was on the pay roll, the other a patient in his ward. These men have been chronic inebriates for years. They obtain their discharge from the hospital, go out, keep drunk for several weeks, and are then readmitted. They have a similar tremor, which almost exactly resembles that of paralysis agitans, associated with the characteristic attitude and gait. They are comparatively young men, hardly having reached middle life.

Dr. T. H. Weisenburg said that he had a most excellent moving picture of a patient with alcholic tremor, one of Dr. Pott's patients. In that particular case Dr. Weisenburg took the picture because of the remarkable resemblance of the tremor to paralysis agitans.

Dr. Cadwalader said that Dr. Spiller mentioned that one of his patients presented some paleness of the temporal side of the optic discs in addition to marked intention tremor. Paleness of the temporal side of the discs is common in multiple sclerosis but is not necessarily characteristic of that condition. Whenever the internal carotid vessels are very sclerotic they may press upon the optic nerves which lie near by and in that way cause paleness of the discs. In Dr. Spiller's patient this may have occurred.

Dr. Spiller said the cases of alcoholic tremor resembling that of paralysis agitans referred to by Dr. Lloyd had been in his (Dr. Spiller's) service and had been used by him in lectures. They were the cases referred to by several speakers.

A PATIENT WITH MARKED ATAXIA OF THE ARMS AND HANDS

By J. Hendrie Lloyd, M.D.

Dr. Lloyd showed this patient. He was an Italian, aged 30 years, a blacksmith, who had always enjoyed good health and denied venereal infection. In 1910, after working out in cold winter weather, he began to have numbness in both hands, which gradually spread to the arms, then to the feet. Then he began to notice unsteadiness in his walking as though he were drunk, also ataxia in his hands. There were no brain symptoms, and he had control of the bladder and bowel.

There was marked ataxia of the arms and hands. On attempting to unbutton his coat the patient moved his arms and hands in an incoordinate way, and used his eyes to assist the motion of his hands. If his eyes were closed the ataxia was much increased. The disorder was not an intention tremor; the man could carry a glassful of water to his lips without spilling a drop. There was no paralysis of his arms or hands; no fibrillation or atrophy; and the tendon reflexes of the biceps and triceps were increased. The patient's lower limbs were not much affected: he swayed perceptibly and staggered slightly when he shut his eyes. The knee jerks were exaggerated, and there was a Babinski reflex. The eye-grounds showed no changes.

The patient complained of a sense of pain or burning beneath his sternum and between his shoulder blades. This seemed something like a girdle sense. The usual tests showed sensation to touch, heat and cold normal over the whole body, except that on the palmar surfaces of the fingers there was anesthesia, and the patient had well-marked astereognosis. Thus he could not distinguish a key or knife held in either hand, and he could not tell the position of his fingers with the eyes closed. There was slight lateral nystagmus, but no speech defects. The cerebrospinal fluid gave negative results when examined by the Wassermann, Nonne, and Noguchi tests.

Dr. Lloyd discussed the differential diagnosis, especially with reference to cervical tabes, multiple sclerosis, syringomyelia, and peripheral neuritis. He concluded that the case did not correspond to any one of these affections, but that it was probably a rather rare form of myelitis of indeterminate causation and pathology.

Dr. C. S. Potts said that he had seen the man for a few minutes recently and he was inclined to the diagnosis of multiple sclerosis. He did not believe it was tabes because, aside from ataxia, there is not another symptom of tabes. On one side he seemed to have a doubtful Babinski. He had marked nystagmus.

Dr. Lloyd said he thought that he had omitted to say that the man's eye-grounds were carefully studied and found entirely healthy. There was no involvement of the optic nerves. Oppenheim states that he had seen what he calls a cervical and medullary form of multiple sclerosis, with ataxia of the arms. This man had no hemianesthesia, such as Oppenheim claims to have seen in his case. He had simple ataxia of the arms. It suggested, but was not identical with, cerebellar ataxia. At first Dr. Lloyd rather objected to the diagnosis of multiple sclerosis, still he could see that there was some ground to support that diagnosis. The condition came on after severe exposure in winter weather. If the patient had been a drinking man, or exposed to lead, Dr. Lloyd said he would have thought of the possibility of a pseudo-ataxia due to peripheral neuritis, but the integrity of the deep reflexes and of the muscular nutrition was altogether against such a diagnosis. The preservation of the deep reflexes was also against the diagnosis of cervical tabes, in which the columns of Burdach in the cervical cord are involved, but the columns of Goll in the same region are exempt.

Dr. S. D. W. Ludlum reported a case of injury of the internal popliteal nerve; associated with double crutch palsy.

Dr. Lloyd said that he had seen this patient in the Philadelphia Hospital. It was an unusual case. The man had had a popliteal aneurism and had been operated on at another hospital; and the impairment of the internal popliteal nerve was found on admission to Blockley. He had distinct anesthesia in the small area supplied by the short saphenous nerve. There was also diminished contractility, atrophy and paralysis of the calf muscles. He was also a cripple with double crutch palsy, having been put on crutches when he left the hospital where the operation had been performed. Both musculo-spiral nerves were paralyzed. Dr. Lloyd suggested that surgeons might be a little more careful to caution patients when they put them on crutches and turn them adrift. This was the second case of double crutch palsy, following surgical operation on the leg, that he had seen within a year. It is bad enough for a patient to be crippled in his leg from some grave surgical condition, without the additional misfortune of being needlessly paralyzed in both arms.

BILATERAL FACIAL PARALYSIS OF THE THIRD AND SIXTH NERVES WITH OPTIC ATROPHY

Dr. H. Maxwell Langdon read this paper.

Dr. William G. Spiller said that he should be inclined to regard the case as probably one of tabes, the positive Wassermann, lost patellar reflex on one side, diminished on the other, slight ataxia, micturition, polyuria, ocular palsies he should be very much inclined to regard that as syphilitic. At the present time Dr. Spiller said he was studying a case of tabes where the ocular muscles were greatly paralyzed. It was very interesting to observe the condition of the ocular motor nucleus. He had not studied the sixth nucleus or the fourth. There were very few cells in the oculomotor nucleus in this case of tabes. The ocular motors are very small, all three, the fourth and the sixth on each side and in the nucleus of the oculo-motor cell there may be few nerve cells and comparatively few nerve fibers coming from the second nuclei.

Dr. Spiller called attention to the fact that when the patient was sitting he was quiet. There were no athetoid movements, such as would be present in Huntingdon's chorea or tic. This is characteristic of this disorder. It is only when he puts his muscle into use that he is thrown into these movements of distortion. We look to the lenticular nucleus for all these peculiar movements of a choreiform or athetoid type.

Dr. Spiller said that Dr. Leopold had asked whether there was any family history of the condition present of tremor. Yes. The oldest one of the three said that his brother did have a history of tremor. They all had a history of excessive alcohol. They have all been using alcohol for a great many years. As for tremor being like paralysis agitans, Dr. Spiller had in his service two brothers with alcoholic tremor that resembled very much cases of paralysis agitans.

PHILADELPHIA NEUROLOGICAL SOCIETY

APRIL 25, 1913

The President, DR. GEORGE E. PRICE, in the chair

Dr. Sam Leopold reported a case of brain tumor.

Dr. W. B. Cadwalader and Dr. E. P. Corson-White read a paper on the relation of syphilis to progressive muscular dystrophy.

Dr. Charles W. Burr exhibited a brain from a woman with acromegaly shown before the Philadelphia Neurological Society some months ago.

PERIPHERAL ANNULAR PIGMENTATION OF THE CORNEA ASSOCIATED WITH SYMPTOMS SIMULATING MULTIPLE SCLEROSIS

By T. B. Holloway, M.D.

Since March, 1910, he had suffered from a marked intention tremor affecting the upper extremities. The head, lips and tongue were also affected. The gait was normal, the biceps, triceps and patellar reflexes were slightly exaggerated, but equal on the two sides. Babinski's sign was absent. Muscular power of the arms and legs was good, and there sciatica. His method was to dissect the sciatic nerve from its adhesions to the surrounding tissue.

Dr. Holloway cited the history of a painter, age 27, who was a patient was no sensory disturbance. Speech was syllabic, slow and deliberate. No pathologic changes were found in the thorax or abdominal organs.

In the cornea of each eye there was a deeply seated peripheral annular brownish green pigmentation, 2 to 3½ mm. in width, that gradually disappeared in the central uninvolved portion of the cornea. Aside from this the eyes presented no abnormalities.

An examination of the urine showed a faint trace of albumin but no sugar. The blood examination showed 75 per cent. of hemoglobin, 4,330,000 red cells, and 7,100 white cells. There was no basic degeneration of the red cells. A levulose test for hepatic function showed a marked lessening of the sugar tolerance. A test for increased sympathetic tonus was positive. A Wassermann test was negative.

Dr. Holloway referred to some of the literature on cases of this type, and stated that the histories of five similar cases showing corneal pigmentation had been placed on record from foreign clinics.

Dr. Spiller said the diagnosis of multiple sclerosis in this case must rest upon intention tremor and somewhat explosive speech. These signs might be sufficient, but the man had been alcoholic, and therefore the diagnosis must be somewhat in doubt.

Dr. Milton K. Myers reported the occurrence of tabes dorsalis with unusual features in an epileptic woman.

Dr. Morris J. Lewis presented a paper on the treatment of chronic

Dr. J. Hendrie Lloyd said that he had been interested in this subject in the University Hospital, on the service of Dr. Mills and Dr. Spiller. for a good while and several times had taken the opportunity to advocate surgical intervention for sciatica. The subject was brought very forcibly to Dr. Lloyd's mind several years ago when he had the opportunity of making an autopsy in a case of sciatica in which the patient had died of intercurrent pneumonia. That man's sciatic nerve was distinctly inflamed. It was visibly so to the eye. He thought it would be a justifiable operation not only to cut down on the nerve but to slit up its sheath to relieve it of its congested fluids. That was the course indicated in that one case at least. Dr. Lloyd believed the old-fashioned remedy of acupuncture, which has been practiced by the Chinese for centuries, may have been beneficial because they may have penetrated the nerve with the long needles and relieved inflammation in that way.

Dr. John K. Mitchell said he saw a case some years ago in the Presbyterian Hospital of which Dr. Lloyd reminded him; a case in which they opened the nerve and found it very much swollen, and, on opening the nerve they turned out a mass from 8 to 10 inches long of a hardened serum resembling a well boiled egg, and the patient recovered entirely at the time, although the sciatica returned afterward. They found no disease in the nerve itself, and the woman tried to bring suit against the hospital, but found she could not get anything out of it.

Dr. Lewis, in closing, said he was perfectly sure of the result in one of the cases, as the man was a chauffeur. He saw him every day and he never had a particle of pain and was in every way capable of performing his duties. Dr. Lloyd spoke of the possibility of collection of fluid within the sheath of the nerve and the probability of relief following the evacuation of the same. Any procedure looking in this direction would naturally have failed, as in these cases no sheath existed.

Dr. John K. Mitchell read a paper on the return of reflexes and other curiosities of tabes.

Dr. J. Hendrie Lloyd said that he thought cases of tabes had been reported in which the knee jerk on the affected side had returned after an attack of hemiplegia; but that was different from the cases Dr. Mitchell had referred to. Dr. Lloyd said he had never seen a return of the reflexes in tabes, but he was very much interested to learn that it sometimes can happen.

Dr. George E. Price said in reference to cases having been operated upon for supposed abdominal conditions which were in reality tabes with visceral crises, that during the past week he had seen one such case at the Jefferson Hospital that had been operated on at another institution for supposed gastric ulcer. The case was typically tabetic, with marked gastric crises.

Dr. N. S. Yawger read a paper on extensive hemorrhage into the pia of the brain.

Dr. Lloyd said possibly some of those present might remember that he had reported a case before the Society a few years ago in which a lumbar puncture was made and a very bloody cerebrospinal fluid obtained, and at the autopsy there was found a ribbon-like clot extending all the way down the cord. It was a case of cerebral hemorrhage. Lumbar puncture was the first thing that gave him a clue to the proper diagnosis. The case had simulated before that basal meningitis, but lumbar puncture made it clear that we had to deal with extensive meningeal hemorrhage. Of course, in a traumatic case, in which the diagnosis was clear, there would not be the same indication. Nevertheless, it would be interesting to know whether the blood had made its way down the spinal meninges.

Dr. Yawger said that he had removed the cord and there was no evidence of serum or blood clots.

his mother Mary was espoused to Joseph, before they came together, *she was found with child of the Holy Ghost.* Then Joseph, her husband, being a just man, and not willing to make her a public example, was minded to put her away privily. But, while he thought on these things, behold the *angel of the Lord appeared to him in a dream,* saying, Joseph, thou son of David, fear not to take unto thee Mary thy wife; for that which is conceived in her is of the Holy Ghost. And she shall bring forth a son, and thou shall call his name Jesus; for he shall save his people from their sins. (Now all this was done that it might be fulfilled which was spoken of the Lord by the prophet, saying, Behold a virgin shall be with child, and shall bring forth a son, and they shall call his name Emmanuel, which, being interpreted, is God with us.) Then Joseph, being raised from sleep, did as the angel of the Lord had bidden him, and took unto him his wife. *And knew her not, till she had brought forth her first born son;* and he called his name Jesus.

Here we interpolate the detailed account of the birth of Jesus, from the Gospel of Luke (2, 4 to 20): And Joseph also went up from Galilee, out of Nazareth, into Judea, unto the city of David, which is called Bethlehem (because he was of the house and lineage of David), to be taxed with Mary his espoused wife, being great with child. And so it was that while they were, the days were accomplished that she should be delivered. And *she brought forth her first born son, and wrapped him in swaddling clothes, and laid him in a manger;*[51] because there was no room for them in the inn. And there were in the same country shepherds abiding in the field, keeping watch over their flocks by night. And, lo, the angel of the Lord came upon them, and the glory of the Lord shone round about them, and they were sore afraid. And the angel said unto them, Fear not; for behold I bring you good tidings of great joy which shall be to all people. For unto you is born this day, in the city of David, a Saviour, which is Christ the Lord. And this shall be a sign unto you, ye shall find the babe wrapped in swaddling clothes, lying in a manger. And suddenly there was with the angel a multitude of the heavenly host praising God and saying, Glory to God in the Highest, and on earth peace, good will toward men. And it came to pass as the angels were gone away from them into heaven, the shepherds said one to another, let us now go even unto Bethlehem and see this thing which has come to pass, which the Lord has made known unto us. And they came with haste, and found Mary and Joseph, and the babe lying in a manger. And when they had seen it they made known abroad the saying which was told them concerning this child. And all they that heard wondered at those things which were told them by the shepherds. But Mary kept all these things and pondered them in her heart. And the shepherds returned glorifying and praising God for all the things which they had heard and seen, as it was told unto them."

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[51] Concerning the birth of Jesus in a cave, and the furnishing of the birth place with the typical animals (ox and ass) compare Jeremias, Babylonisches in Neuen Testament (Leipzig, 1905), p. 56, and Preuschen, Jesus Geburt in einer Höhle, Zeitschrift für die Neuesten Wissenschaften, 1902, p. 359.

We now continue the account after Matthew, in the second chapter: "Now when Jesus was born in Bethlehem of Judea, in the days of Herod the king, behold, there came *wise men from the East* to Jerusalem, saying, *Where is he that was born King of the Jews,* for we have seen his star in the east, and have come to worship him. When *Herod the king* had heard these things he was troubled and all Jerusalem with him. And when he had gathered all the chief priests and scribes of the people together, he demanded of them where Christ should be born. And they said unto him, in Bethlehem of Judea: for thus it is written by the prophet, And thou Bethlehem in the land of Juda, art not the least among the princes of Juda, for out of thee shall come a governor which shall rule my people Israel.

Then Herod, when he had privily called the wise men, enquired of them diligently what time the star appeared. And he sent them to Bethlehem, and said, Go and search diligently for the young child; and when ye have found him, bring me word again, that I may come and worship him also. When they had heard the king they departed; and lo the star, which they saw in the east, went before them till it came and stood over where the young child was.

(*To be continued*)

Periscope

Brain

(Vol. 34, Part 4)

1. Progressive Lenticular Degeneration. A Familial Nervous Disease Associated with Cirrhosis of the Liver. KINNIER WILSON.
2. A Case of Sub Acute Combined Degeneration of the Spinal Cord Demonstrating the Nature of the Afferent Impulses in the Posterior Columns. THEODORE THOMPSON.

1. *Progressive Lenticular Degeneration.*—Wilson here describes a new syndrome in this extremely suggestive and thorough paper. He gives a full description of this rare nervous disorder to which he applies the term progressive lenticular degeneration. The disease is familial, in the sense that frequently more than one member of a family is affected with it, but it is not hereditary; it may also occur sporadically. It occurs always in young people, either in an acute or a chronic form. He states that as far as his present knowledge goes it is progressive and invariably fatal, its duration ranging from six months or a year to as long as four or five years. The clinical symptoms form a complex which, once the physician is familiar with it, can be readily recognized; one which is of great interest and importance, constituting as it does what may be considered to be a pure syndrome of the corpus striatum. In a word, it consists of involuntary movements, nearly always a bilateral tremor of both upper and lower extremities, the head and trunk also being sometimes involved. The tremor is usually rhythmical but occasionally irregular, and increasing with volitional movement; there is pronounced spasticity of the limbs and of the face, the latter being usually set in a spastic smile, while in the latter stages contracture of the limbs develops; there is dysphagia and dysarthria, the latter eventually degenerating into complete anarthria; there is also spasmodic laughing and emotionalism. As a result of the extraordinary degree of stiffness of the musculature there is considerable difficulty in maintaining equilibrium. Little or no true paresis or paralysis occurs, however, inasmuch as most ordinary movements, if not all, can be executed, though it may be slowly and feebly. In some cases certain mental symptoms, of a transitory nature, manifest themselves, and their significance is fully discussed. In spite of the great degree of motor weakness and helplessness, in a pure case the abdominal reflexes are preserved and a double flexor response is obtained. In other words, this affection, where it occurs in an uncomplicated form, is an extra pyramidal motor disease, the importance of which is apparent not only because of its rarity, but also by reason of the light it sheds on such a process as paralysis agitans.

The pathology of the disease is as striking as the clinical syndrome. As his figures show, the lesion is a bilateral symmetrical softening in the lenticular nucleus, involving more particularly the putamen; the globus pallidus is affected to a less extent. In addition the external capsule may be partly included in the area of disease; the caudate nucleus may be slightly degenerated, but—most important of all—in a pure case the internal capsule is absolutely intact. The optic thalamus similarly escapes. Certain important secondary degenerations follow from the lenticular disease. If the diseased areas are examined minutely it will be found that a change begins apparently round the lenticulo-striate vessels, as a result of which the substance of the lenticular nucleus begins to shrink and atrophy; its cells and its fibers disappear and their place is taken by glial tissue, the laminae medullares and internuncial fibers becoming less and less distinguishable; in advanced cases the nucleus breaks down entirely, and a cavity formation is the result. There is no sign of syphilitic disease of the vessels concerned, all of which are patent; their walls, indeed, often appear to be rather thinned. Gross vascular disease is conspicuous by its absence. It is clear the condition is not due to a thrombotic process in the distribution of a particular blood-vessel; on the contrary, the peculiar selective action of the morbid agent will be readily appreciated when it is remembered that the lenticular nucleus is supplied from three different sources. Yet in this disease one collection of grey matter is singled out, while neighboring grey matter areas are left intact. Compared with this bilateral symmetrical degeneration of the lenticular nucleus and associated alterations, the other changes found in the central nervous system are slight and comparatively unimportant.

The most curious and remarkable feature of this disease is the constant presence of a profound degree of cirrhosis of the liver. This hepatic cirrhosis does not reveal itself by any symptoms during life, nevertheless it is always found after death. It is mixed in type. The writer believes that syphilis and alcohol, as possible morbific agents in connection with the cirrhosis, can be entirely excluded. This association, in young people, of cirrhosis of the liver with bilateral symmetrical softening of the lenticular nucleus constitutes the disease from the pathological standpoint; clinically, the symptoms are exclusively nervous. Other organs (thyroid, etc.) show changes of secondary importance.

Six cases are described, two of others' and four of the author's own cases. These are all described with great completeness. The author's own conclusions are as follows:

(1) Progressive lenticular degeneration is a disease of the motor nervous system, occurring in young people and very often familial. It is not congenital or hereditary.

(2) It is often progressive and fatal within a varying period; acute cases may last only a few months; one chronic case has as a maximum continued for seven years; the average duration of chronic cases is four years.

(3) It is characterized by a definite symptom-complex, whose chief features are: generalized tremor, dysarthria and dysphagia, muscular rigidity and hypertonicity, emaciation, spasmodic contractions, emotionalism. There are also certain mental symptoms, either transient and such as one sees in a toxic psychosis, but not severe, or more chronic, consisting in a general restriction of the mental horizon, and a certain facility or docility without delusions or hallucinations, and not necessarily as progressive as the somatic symptoms. The mental symptoms are very slight and are sometimes absent.

(4) In pure cases the affection constitutes an extrapyramidal disease, for the reflexes are normal from the point of view of the function of the pyramidal tracts.

(5) The neurological symptoms constitute a syndrome of the corpus striatum, which has not hitherto been differentiated in this disease.

(6) In some ways the disease bears a resemblance to paralysis agitans, and throws light on the problem of that affection.

(7) Although cirrhosis of the liver is constantly found in this affection, and is an essential feature of it, there are no signs of liver disease during life.

Pathologically he concludes that

(1) The chief pathological feature of the disease is bilateral symmetrical degeneration of the putamen and globus pallidus, in particular the former.

(2) This degeneration is the sequel to the selective operation of some morbid agent on the cells and fibers of the putamen and lenticular nucleus generally. The caudate nucleus is often somewhat atrophic, but never to the same extent, while other large collections of grey matter in the immediate neighborhood of the lenticular nucleus—*e. g.*, the optic thalamus, which has partially the same blood supply—is not affected at all in a pure case unless it be indirectly, and to a very slight extent.

(3) The morbid agent is probably of the nature of a toxin.

(4) A constant, essential, and in all probability primary feature of the pathology of the disease is cirrhosis of the liver, not syphilitic or alcoholic; it is multilobular or mixed in type, always pronounced, but presenting a varying pathological picture of necrosis, fatty degeneration, and regeneration.

(5) It is probable that the toxin is associated with the hepatic cirrhosis, and may be generated in connection therewith. An important analogy may be drawn from the occurrence of "Kernikterus" in certain cases of familial icterus gravis neonatarum, where in spite of the universal bile-staining of the tissues of the body certain collections only of grey matter in the brain show a marked affinity for the circulating poison, while others do not. The parts that are stained deeply are in particular the nucleus lenticularis and the corpus Luysii (among others), while the optic thalamus, for instance, is scarcely stained at all.

(6) The pyramidal tracts are intact from Betz-cells to muscles in a pure case; occasionally certain secondary changes occur of limited significance.

(7) Certain secondary degenerations in the subthalamic region, of physiological importance, follow on the lenticular disease.

His physiological conclusions are:

(1) The corpus striatum exercises a steadying effect on the action of the corticospinal system.

(2) This is affected either by the lenticulo-rubrospinal system, or more indirectly via the optic thalamus and its cortical connections.

(3) When this influence is impaired, pyramidal function is affected in its turn, and is seen in hypertonicity or rigidity, as well as in tremor on voluntary movement.

(4) There is not, however, any paralysis in the strict sense.

(5) The direct connection of the corpus striatum with the cortex is minimal.

(6) There is no necessity to postulate articulatory "centers" in the putamen or globus pallidus.

(7) Dysarthria may result without any pyramidal involvement of genu fibers, and with intact cranial nuclei, from hypertonicity of the musculature concerned.

(8) Tremor is due more particularly to failure of function of the lenticulo-rubrospinal system.

(9) Hypertonicity or rigidity of the musculature, due to defect of the "inhibitory" action of the corpus striatum, is possibly associated with impairment of impulses from that body via the optic thalamus to the cerebral cortex.

2. *Afferent Paths in Posterior Columns.*—Thompson details the history of a patient with a lesion of the posterior columns from progressive anemia, utilizing it for the study of the afferent pathways. His conclusions are as follows:

(1) The case is one of "subacute combined degeneration," in which the lesions are almost confined to the long fibers of the posterior columns.

(2) The degeneration was associated with severe anemia of a secondary type. The degeneration and anemia were probably caused by toxins absorbed from a large, chronic, granulomatous ulcer in the stomach.

(3) The case shows that a complete lesion of the long fibers of the posterior columns of the spinal cord results in a loss of the sense of passive position, ataxia, and loss of discrimination of points and weights. Localization of touch is but little affected. This result agrees with the experiments of Page May, who has recently reviewed the experimental work upon this subject.

(4) Painful, thermal, and tactile impulses can ascend the cord, although the posterior columns are degenerated.

(5) The evidence derived from this case is at variance with the view of Pétren, that a lesion of the posterior column does not produce a loss of muscle-sense unless the dorsal spino-cerebellar tract in the same half of the spinal cord is likewise affected.

Jelliffe.

Revue Neurologique

(December 15, 1912)

1. Syndrome of Brown-Sequard. Guillain.
2. The Signs of Organic Disease in the Chorea of Sydenham. Grenet and Loubet.

1. *Syndrome of Brown-Sequard.*—The report of a case in which the symptoms were probably caused by a tumor pressing on the spinal cord at about the level of the sixth dorsal segment. There was a spastic paralysis of the left leg with increased tendon reflexes and a positive Babinski reflex. There was a hypasthesia, analgesia and thermoanesthesia on the right side, extending downward from the mammary region and to the midline of the body, and involving the entire right leg. The sense of motion and position was normal in both lower extremities.

2. *Signs of Organic Disease in Sydenham's Chorea.*—The authors divide the signs investigated into two classes: the signs of irritation of the pyramidal tract and the cerebellar signs. The presence of the former is a more reliable indication of organic disease. In seventy-four observations, hypotonia was present fifty-one times; adiadococinesia, forty-three times; Babinski's sign, nineteen times; etc., the absence of organic signs in some cases depending no doubt on the localization of the lesions. It is also observed that the organic signs are more frequently found when the examination is made in an early stage of the disease.

(December 30, 1912)

1. Ocular Complications of Aneurism of the Aorta. Aneurism of the Aorta and Tabes. H. FRENKEL AND R. DE SAINT-MARTIN.
2. Concerning an Article by M. W. Sterling on the Synchronous Adduction of the Affected Arm in Organic Hemiplegia. NOICA.

1. *Ocular Complications of Aneurism of the Aorta.*—Oculomotor paralysis and changes in the pupillary reactions accompanying aneurism of the aorta are probably due to the syphilitic infection or to the tabes rather than to the circulatory change produced by the aneurism. In the case reported there was a complete oculomotor paralysis with a fixed pupil on the left side and on the right side an irregular and fixed pupil. The tendon reflexes in the lower extremities were abolished. There were distinct signs of aortic insufficiency and an aneurism of the ascending portion of the arch of the aorta.

2. *The Synchronous Adduction of the Affected Arm in Hemiplegia.*—The author contends that the movement does occur in a complete paralysis of all voluntary movement providing the paralysis is of the spastic type.

CARL D. CAMP (Ann Arbor, Mich.).

Monatsschrift für Psychiatrie und Neurologie

(Vol. 32, No. 2, August, 1912)

1. The Influences of Emotional Factors on the Associations. KARL BIRNBAUM.
2. The Central Convolutions in Tabes Dorsalis. LAWRENCE SELLING.
3. The Anatomical and Clinical Findings in Occlusion of the Posterior Inferior Cerebellar Artery. ERHARD SCHWARZ.
4. Contribution to our Knowledge of Glycosuria in Mental Diseases. S. MITA.

1. A continued article to be reviewed at its conclusion.

2. *Central Convolutions in Tabes.*—In 1905 Campbell reported the finding of alterations, especially a cell-loss in the post-central convolution in tabes. Neither Holmes nor Brodmann who subsequently investigated this region in tabetics could confirm these findings. The author studied the brains of four cases of tabes using the Nissl stain and sections 20 micra thick. No constant alterations were found. Some cases showed neuroglia increase in various places, others showed chronic cell-alteration. Campbell's reported loss of nerve-cells could not be confirmed.

3. *Occlusion of Posterior Inferior Cerebellar Artery.*—A case with autopsy is reported together with clinical observations on three others. The anatomical finding was a small focus of softening in the right side of the medulla involving ventral and spinal divisions of the trigeminal root, the spino-cerebellar, -tectal and -thalamic tracts, Monakow's bundle, olivo-cerebellar fibers, nucleus ambiguus, part of nucleus lateralis, lateral portion of olive and dorsal accessory olive. After considerable improvement following the attack, the persistent symptoms consisted of vertigo with tendency to fall to the right, burning pain in the right half of the face and head, and left half of body, loss of all qualities of sensation in the region of distribution of the first and second branches of the trigeminus on the right, loss of pain and temperature sense over left half of body, rotatory nystagmus on glancing to the side, paralysis of right

vocal cord, ataxic gait, Romberg sign, loss of tendon reflexes except weak response of right patellar, weakening of corneal reflex on right. The article is illustrated by photographs.

4. *Glycosuria.*—In order to ascertain if glycosuria was associated with any particular psychosis or accompanied certain emotional states, the author examined carefully the urine of 45 patients with depression or anxiety and, as control, that of 21 patients who were free from such affects. Among the first group, 8 cases showed glycosuria, although, to be sure, the quantity was slight and the other symptoms of diabetes absent. Of the control group only one case showed sugar. The number of cases is admittedly too small for definite conclusions but sufficient to suggest a certain relationship between glycosuria and depressed states.

(Vol. 32, No. 3, September, 1912)

1. The Question of the Affect in Paranoia. E. FORSTER.
2. The Influences of Emotional Factors on the Associations. K. BIRNBAUM.
3. The Etiology of Sexual Perversion. E. STIER.
4. A Case of Korsakow's Psychosis on a Basis of Diabetic Acidosis. O. SITTIG.
5. The Brain of a Case of Motor Apraxia. HIRSCH-TABOR.
6. The Study of the Feeling of Strangeness. O. JULIUSBURGER.

1. *Affect in Paranoia.*—An argument by the author in reply to criticisms of his theories by Bleuler in 1908. The writer contends that psychological questions would be most satisfactorily settled if arguments were confined to results based on brain pathology and animal experimentation. Pain is the only element in the discussions of affect with which one can always work. By it one can discover whether a person is ill or not, whether his conduction paths are intact and we can measure the degree of the disorder. One desires, in psychology, not a philosophical but a scientific explanation and from this standpoint pain is the only essential in the affect. The author believes that Bleuler, in his consideration of affect in hebephrenias has not sufficiently taken into account the difference in the outward expression of emotions which exists among different individuals, nor the important part that dissociation of ideas may play, even in a person whose mind is rich in associations. The discussion is largely academic.

2. *Emotional Factors.*—Association tests were carried out in several patients, employing words selected with a view to arousing emotions. The reaction to these was compared with that to indifferent words and the conclusion seems warranted, with certain reservations, than an insight into the emotional state may thus be gained or, at least, facilitated. In general the depressed states showed a marked lengthening of reaction-time and especially depressed reaction to words with a depressive purport. In hysteria there was also lengthened reaction-time and decided tendency to a depressed coloring, not only in the verbal response but also in the shape of sighing and weeping. This reaction was greater to words of emotional content but quite as great to those of cheerful as to those of depressive suggestion.

3. *Sexual Perversion.*—Exception is taken to the theories, particularly those of Näcke, which conceive of a congenital homosexuality. The author has had excellent opportunity to observe the sexual manifestations

of young children and among 3,000 cases in the children's division of the nervous and mental polyclinic of the Charité, which number included many instances of juvenile criminality, homosexuality did not occur. Other perversions, especially sadism, were common. Homosexuality is peculiar to the human species and the reason for it probably lies in the relative subordination of the primitive sexual instinct to the higher emotional spheres. The olfactory apparatus which, in the lower animals, forms so large a portion of the brain and has to do almost exclusively with the sexual attraction of the male sex to the female, is reduced to a minimum in man and ordinarily plays but a slight rôle in the sexual life. In man, then, self-differentiation is much weaker than in other animals and it needs but some slight disharmony in degree between sexual impulse and mentality or some maladjustment of environment to develop a permanent homosexual perversion. The theories of an intermediate stage in sex-development and of a bi-sexual anlage are inconsistent with the facts.

4. *Korsakow's Psychosis.*—A classical example of Korsakow's mental syndrome in diabetes, which disappeared coincidently with the reduction of acetone and diacetic acid in the urine through treatment. Psychoses due to diabetes are very rare and a case like the one described has probably never been reported.

5. *Motor Apraxia.*—An important contribution to the subject of apraxia. The clinical history which was given in detail by Bychowski in Vol. XXV of the *Monatsschrift* is briefly as follows: A right-handed man of 30 began to suffer from headaches and vomiting. Power of speech and writing and ability to use the right leg and arm were gradually lost. Eighteen months after the onset, examination showed no indication of paralysis, no neurological signs of any sort objectively. The right arm showed preservation of motor strength but inability to carry out movements, a motor apraxia of Liepmann. The left arm showed occasional dyspraxia but movements could usually be executed and, after having been executed by this arm, could often be copied by the right. The speech showed agrammatism and perseveration, no motor disturbance. He understood spoken words. He could read aloud but without understanding. Single letters were written with the right hand but whole words were impossible unless first written by the left hand. There was some dyspraxia with left hand. Death occurred 19 months after first symptom. The brain showed syphilitic meningo-encephalitis and a large cyst about 6 cm. in diameter with neighboring softening occupying the left hemisphere subcortically. The structures involved were, briefly, the island, lower third of anterior central gyrus, first temporal and anterior portion of second and third temporal gyri, lenticular and part of caudate nuclei, retrolenticular portion of internal capsule. The association connections of the third frontal and of the angular and supramarginal gyri were partially destroyed. The corpus callosum showed reduction in those regions connected with the areas of greatest destruction but was little affected in the middle portion which Liepmann has shown to be the essential part for eupraxia of the left arm. A summing up of the clinical and anatomical pictures closes the article. The preservation of the sensomotorium for the arm in the left hemisphere and the only slight affection of its fibers in the internal capsule account for the absence of paralysis of this member. On the other hand it was almost completely isolated from its connections with the optic, acoustic and tactile centers and herein lay the cause of the apraxia. The accompanying dyspraxia in the left

hand was due, not to the interruption of its connection with the controlling hemisphere, as in cases with callosal defects, but to the entire impotence of the arm center in that hemisphere.

6. *Feeling of Strangeness.*—When the mental mechanisms are distorted in their normal relations with each other, a subconscious complex is allowed to come to the surface and produces an impression of incongruity with the environment. It is not unlikely that paranoic ideas arise in a similar manner. A subconscious complex breaks through and is projected into the outer world in the form of delusions.

J. W. MOORE (Central Islip, L. I.).

Review of Neurology and Psychiatry

(Vol. X, No. 3)

1. A Case of Pseudo-Bulbar Paralysis. WALTER K. HUNTER and M. E. ROBERTSON.
2. The Cerebro-Spinal Fluid. D. K. HENDERSON.

1. *A Case of Pseudo-Bulbar Paralysis.*—The lesion was a bilateral one in the upper motor pathways. There were symptoms of bulbar paralysis without lesion of the bulb. The onset was sudden in a man of 43. He was taken giddy and ill, but walked home from work. His gait was unsteady; mouth drawn to the right; left angle of mouth depressed; slight weakness of left arm and leg. After two weeks in bed, he dragged the left foot slightly, and the left arm was "shaky." Resumed work in two months, but was troubled with headaches. Worked steadily for three years, then had a second "seizure." He awoke at 2 a. m. with right hemiplegia and loss of speech. He could open his mouth but slightly and was unable to chew or swallow properly. There were drowsiness and increased somnolence for two weeks and temporary involuntary micturition. He could still read and write; and after six weeks under emotional disturbance (anger) he could speak. There was no disturbance of sensation. Three months after the inception of the second seizure, he was admitted to the Glasgow Royal Infirmary where, on examination, he was found to be emaciated; face expressionless; saliva dribbled from the mouth; voluntary facial movements were weak; emotional movements more vigorous. There was paresis of the tongue; no atrophy. The soft palate moved but slightly on phonation. Attempts at swallowing were difficult and attended by coughing. Fluids tended to run out at the corners of the mouth. Mastication was slow and imperfect. Speech was indistinct and mumbling. Voice high pitched but not nasal. Understanding was good. Writing was performed, but laborious. Emotional weeping was frequent. Fundi were normal except slight pallor of right disc. Right leg and arm were less strong than left. Imperfect Babinski, right and left. Abdominal reflexes absent. Sensation intact. Sixteen days after admission patient became drowsy; right pupil became larger than left; eyeballs were drawn to the left and downward; nystagmus developed; eye-lids drooped; face cyanosed; mucus gathered in the air tubes; patient died.

On autopsy, the dura was tense; pia edematous; a recent clot was found in the left vertebral artery; the basilar was contracted to a thin cord. A lesion was found (softening) of both internal capsules, each lesion limiting itself more or less entirely to the fibers which control the movements for articulation, phonation, mastication, and deglutition. There was also a slight involvement of the optic thalami and lenticular nuclei, which may account for the polyuria and incontinence from which the patient suffered, and also for his emotional seizures. Fiber degeneration was traced through the crura and also into the cord. The lesion on the right side was older than that on the left and had undergone more shrinkage. Otherwise, the lesions were symmetrical.

2. *The Cerebro-Spinal Fluid.*—The object of this paper was to compare the findings in 55 cases of general paralysis; 20 of cerebral lues; 16 of psychoses with other nervous disorders; 14 of alcoholic psychoses; 8 of functional acquired states; 3 of constitutional inferiority; and 4 of undiagnosticated cases. The writer's conclusions are as follows:

1. A cytological, chemical, and serological examination of the cerebrospinal fluid and blood serum is essential in the diagnosis of organic types of mental disease.

2. The Fuchs-Rosenthal method of cell counting is the quickest and most accurate, and allows comparative results; for differential cell-counting the method devised by Alzheimer offers the greatest possibilities.

3. The Ross-Jones test for the recognition of globulin is the most satisfactory owing to the fact that it is the easiest to read, and is just as accurate as either the butyric acid test of Noguchi or the Nonne-Apelt test.

4. The Noguchi modification of the Wassermann reaction is a reliable test in the diagnosis of syphilis; the results obtained by it closely correspond to those of other workers who have used the original Wassermann reaction.

5. In general paralysis the characteristic findings are pleocytosis, positive globulin reactions, and a positive Wassermann reaction both with the blood serum and cerebro-spinal fluid.

6. Cases of cerebral syphilis frequently give a negative Wassermann reaction with the cerebro-spinal fluid—a point of considerable importance in differentiating between general paralysis and cerebral syphilis. This negative reaction occurs particularly in non-progressive cases, or in cases which have received a large amount of anti-syphilitic treatment.

7. Cases of alcoholic insanity, dementia præcox, etc., give uniformly negative results, unless the person has had a syphilitic infection.

The findings are tabulated.

C. E. Atwood, New York.

Deutsche Zeitschrift für Nervenheilkunde

(Band 45, Heft 1)

1. Traumatic Affections of the Spinal Cord. Erb.
2. Occupation Paralysis. Mirowsky.
3. Intermittent Claudication. Starker.
4. Encephalitis. Langbein and Oeller.

1. *Traumatic Affection of the Spinal Cord.*—Report of a case of progressive muscular atrophy due to direct injury from occupation. Fifteen years ago Erb reported two cases and ventured the statement that this disease is sometimes the result of light injury, muscular over-exertion and similar occupation traumas. Such cases are rare. He saw only one other case reported. In his case, a young man with no hereditary taint or predisposition, developed a muscular atrophy as the result of a direct injury to the small muscles of the hand. This extended from below

upward. It has remained stationary during two years of observation. This injury, according to Erb, damaged the nerve-muscle apparatus. He has been able to exclude with absolute certainty all other cause. He collected all cases of chronic anterior poliomyelitis, etc., in which a history of light trauma, muscular over-exertion, or a combination of the two could be considered as the cause. In all three types, psychic trauma must not be excluded.

In his former article, he discussed the problem of the conditions producing the atrophy. We are not much further advanced in its solution. Then he assigned to concussion the chief rôle, and over-exertion was a secondary factor. To-day, he finds that over-exertion may be the only pathogenic factor. Through concussion certain molecular changes occur in the affected nerve elements, which, under favorable conditions, produce the degenerative process. This, however, is only a hypothesis, in which many obscure facts still remain to be proven. For the harmful effects of over-exertion, he advocates Edinger's exhaustion theory. In his case, he believes that, as the result of the over-exertion, certain chemical or molecular metabolic disturbances were introduced in muscle and neuron. But as this also frequently occurs in normal individuals without the production of disease, it is necessary to consider other factors, such as congenital tissue weakness, hereditary predisposition, syphilitic and other toxic substances, cold and psychic influences. Erb does not think that these need be considered.

2. *Occupation Paralysis.*—The author reports a series of clinical cases illustrating how frequently occupation plays the important rôle in disease of the peripheral nerves, and how the character of the work influences the distribution of the paralysis. Atypical cases are more clearly interpreted from this viewpoint.

3. *Intermittent Claudication.*—Clinical report of a case which showed marked arteriosclerosis, weakness of the pulse in the left plantar, failure of pulse in both tibials, vasomotor phenomena, and intermittent lameness. The symptoms of muscular atrophy, sensory disturbance, loss of knee jerks indicated also an associated multiple neuritis.

4. *Encephalitis.*—Clinically the case showed headache, coma, slowing of the pulse and convulsions. It was difficult to distinguish between sinus-thrombosis and encephalitis. Microscopically, a meningitic process was noted in the tela of the third ventricle and in the choroid plexus of the lateral ventricles with phlebitis and thrombosis.

S. Leopold (Philadelphia).

MISCELLANY

Brain Tumor. E. E. Morrison. (Journal A. M. A., April 26.)

The author reports a case of brain tumor in a woman, aged 59, whose family history was good, except that her mother died of carcinoma of the breast. The clinical history showed headache, vomiting, defective vision, vertigo, hebetude, delusions, hallucinations, paresthesia, paralysis, ataxia, disorientation. Physical examination three months before death revealed most organs and functions normal. There were present, however, moderate emaciation, sluggish pupillary reflex, second and third cranial nerves not performing their functions properly, slight reduction of hemoglobin, and ophthalmoscopic examination revealed a choked disk.

Ten days before death the patient became unable to swallow and rapid heart action developed. Death occurred ten months after initial symptoms of disease. Necropsy revealed that "on each side of the longitudinal fissure from a point near the occipital lobe to a point on the paracentral lobule, there extended a thin seminodular tissue formation of a pearly white color, having the gross appearance of an endothelial formation. At the paracentral lobule, the dura was adherent to the foreign tissue. In the right hemisphere of the cerebellum in its lower and anterior portion, behind the wall of the fourth ventricle, pressing on the pons, encroaching on the space normally occupied by the vermis and extending across the cerebellar notch nearly one-half inch, was a round, dark-colored tumor about the size of an English walnut, apparently encapsulated and having about the consistency of the normal brain." The author gives the pathologic findings, which he says would indicate that the tumor should be classified as gliosarcoma "according to Oppenheim's classification, though perhaps a more accurate designation would be malignant glioma as suggested by a number of recent writers."

However, malignant tumors of the brain have not yet been classified in a manner satisfactory to all pathologists. There is a disposition to place all malignant connective tissue tumors of the brain under the head of malignant gliomas. The problem is an involved one, the author says, and he describes pathologic findings in this case and explains his reasons for the classification he makes. The article is illustrated.

PROPHYLACTIC MENINGITIC VACCINATION. J. H. Black. (Journal A. M. A., April 26.)

The author refers to the former paper by Dr. Sophian and himself on prophylactic vaccination against meningitis (Journal A. M. A., Aug. 17, 1912, p. 527) and reports the results of the repetition of the former experiments by himself on eight of the ten original subjects. The technic was identical with that before reported and in addition to the blood of a normal individual, acting as a negative control, the blood of a student recently recovered from a severe attack of meningitis was used as a positive control. He recognizes the fact that the experimental vaccination of healthy persons in the absence of an epidemic and the detection of immune bodies in the blood is an indirect way of proving its efficacy, which must be finally judged by its clinical application. He gives a tabulated statement showing the results of complement fixation in these cases and considers the following conclusions justified: "(1) Prophylactic vaccination produces a high degree of immunity in most cases, this immunity being demonstrable at the end of one year. It seems a justifiable conclusion that most individuals prophylactically vaccinated may safely consider themselves immune for at least one year. Exceptions to this will, of course, be found. (2) Some individuals may show an actual increase in immune bodies at the end of the year over those demonstrable soon after vaccination. (3) Fixation occurred with the serum of the positive control who has recovered from meningitis but this fixation did not reach as high dilutions as did some of those vaccinated. This has been previously found also in some others recovered from the disease. (4) Experimental evidence warrants us in concluding that prophylactic vaccination is a measure of the greatest value in the control of the epidemic meningitis."

Book Reviews

NERVOUS AND MENTAL DISEASES. By Archibald Church, M.D., and Frederick Peterson. Seventh Edition. W. B. Saunders and Company, Philadelphia and London.

Any work that has achieved a seventh edition must have merit. This new edition is even better than its predecessors as it has been much revised, particularly the chapters dealing with the psychoses. We here miss Meyers' masterly review of former editions which has not been made good by the addition of equally valuable material. The mediæval point of view of still speaking of and describing all the various psychoses as "insanity" is still unfortunately followed. The Krafft-Ebing stage of evolution of the paranoia concept is reflected in the unduly large chapter, devoted to a comparatively rare condition, whereas many of the most frequent psychoses are entirely omitted or only mentioned by name under the chapter on etiology. This with other feautres makes the section on psychiatry very uneven, though much more acceptable than in previous editions.

MANISCH—DEPRESSIVES UND PERIODISCHES IRRESEIN ALS ERSCHEINUNGFORM DER CATATONIE. Maurycy Urstein. Urban & Schwarzenberg, Berlin, Wien.

Urstein's book is divided into 8 chapters: the first contains the introduction. In the second the author outlines the nature of his casuistic material; the third contains the analysis of thirty cases; the fourth chapter deals with the symptomatology, etc.; and the other chapters refer tò causes and nature, the course of the clinical picture, terminations, etc. Some of his cases were studied and observed by many clinicians and it is worthy of note that some of his patients entered the hospital for the insane in Zehlendorf as early as 1867, 1874, 1876, etc. One is impressed with the fact that the author drew his conclusions not from his personal observation of the cases but rather interpreted the clinical material which was studied by others. The clinical records are superficially observed and on the whole the material does not lend itself to correct interpretation.

The author's argument may be stated shortly as follows: He identifies catatonia with dementia precox, because there are many cases which, in spite of long duration of the disease, display no signs of deterioration in the emotional or intellectual sphere, however catatonic symptoms may have been in the foreground. He also maintains that dementia precox may be ushered in with an attack resembling manic depressive psychosis and which terminates in recovery, but later catatonic features may be noted and ultimately dementia precox may result. The duration of the lucid periods may vary—in some of his cases they lasted over thirty years. .In these catatonic pictures manic, hypomanic, mixed and depressive states are frequently noted. In three and one half per cent. of his cases convulsions occurred. The author believes that dementia precox is due to auto-intoxication processes and does not favor the theory of an organic disease.

Inasmuch as the investigations are based on purely objective interpretations, without attempting to make a finer differentiation between these two large groups, dementia precox and manic depressive insanity, the author's results can hardly be regarded as final. There are, no doubt, some cases of dementia precox which may present few symptoms of manic depressive insanity; and again in some instances manic depressive attacks may display few catatonic features, but this would not justify us in grouping them under one head.

After all, one of the trends in modern psychiatry is to make finer distinctions between the clinical groups, indeed, Kraepelin, in his recent article on paranoia, gives a very good illustration of what one can do in the analysis of clinical pictures.

CONZELMANN.

NERVOUS AND MENTAL DISEASES. By Dr. Charles S. Potts, Professor of Neurology, Medico-Chirurgical College, Philadelphia. Third edition, 610 pages, 141 engravings and 6 plates. Lea and Febiger, Philadelphia and New York. 1913.

This popular manual has for the most part undergone careful revision and considerable new matter has been added. As it now stands, the section on neurology is admirably adapted to the needs of the student. Little attempt has been made to introduce matter purely academic in nature, but we cannot refrain from observing that it would be embarrassing to S. Weir Mitchell to know that he is still credited with being the first to use muscular movements according to a fixed schedule. He wasn't even the first in this country!

Scarcely one tenth of the space is devoted to mental diseases and this is not sufficient. As to the newer matter, but little has been included. Freud has given tremendous impetus to psychoanalytic study, although many views now held will doubtless undergo extensive modification. For some years the insane, for the most part, have been humanely cared for, but a study of the intricate processes of psychiatry, together with the application of appropriate therapeutic measures other than drugs, has lagged behind; but psychoanalysis is here to stay and the present-day text-books should not neglect this important subject.

The imbalance between the nervous and mental sections of which we speak is somewhat more apparent than real, since we find a number of mental affections have been wholly included in the part devoted to nervous diseases; of these are tic, neurasthenia, psychasthenia, the anxiety neurosis, hysteria and epilepsy.

The part dealing with neurology is concise, lucid and intensely practical, and for these reasons we believe the needs of the student are better met here than in any English publication of the same size.

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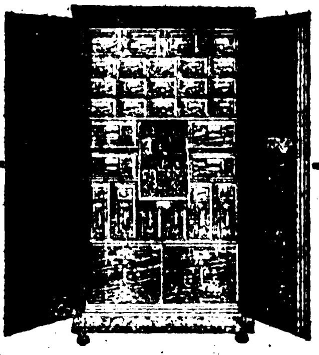

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Original Articles

BLINDNESS AND TABES. AN INTRODUCTION TO A NEW METHOD OF CURING ATAXIA

By William J. M. A. Maloney, M.D., Ch.B., F.R.S. Edin.,

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The occurrence of blindness in tabes has been known since tabes was first recognized. Romberg observed it (1840–1857). The great Duchenne (1858), in his original description of the disease, mentioned two cases of *ataxie locomotrice progressive* which were associated with blindness, and which ran an unusually long course. Similar cases were later reported; but before Westphal (1875) discovered that the knee jerks disappear in tabes, tabes was diagnosed mainly from the presence of ataxia, and only blindness associated with ataxia was attributed to a tabetic process. Westphal's discovery made possible the recognition of the preataxic tabetic and Charcot, Gowers and Leyden quickly identified a number of such cases, some of which had optic atrophy. In 1881, Moriz Benedikt of Vienna asserted that tabes associated with rapid optic atrophy shows benign spinal symptoms.[1] He was the first to insinuate a causal relationship between the mildness of the spinal symptoms and the presence of the optic atrophy. Fournier in 1862 more cautiously recognized tabes with blindness as the " forme fruste par excellence."

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[1] "Obwohl wir nicht im Stande sind auf dem Verlauf der Sehnervenatrophie irgend einen wesentlichen Einfluss zu nehmen dieselbe vielmehr gewohnlich rapid usque ad ultimum fortschreitet so können wir doch im Bezug auf die spinalen Symptomen wenn sie noch so ausgebildet und intensiv sind die Prognose höchst gunstig stellen. Eine Ausnahme machen vielleicht nur sehr veraltete Fälle. Es kann geschehen dass mit Ausnahme des Schwankens beim Stehen mit geschlossenen Augen und der Sehnen reflexe die nicht mehr zum Vorscheine kommen all ataktischen Symptome schwinden."

Gowers in a paper such as only he could write, a paper brilliant, judicial, and conservative, a paper written thirty years ago, which omitted little that we now know, and included nothing that we now deny, states, " When atrophy commences in the early stages, the progressive tendency is often strong, and that of the spinal disease slight, and conversely, when the atrophy commences later in the disease, after the alteration in the gait has become well marked, the tendency of the atrophy to progress is much less marked." He pointed out that atrophy occurs at least twice as frequently, and probably still oftener, in the preataxic than in the ataxic stage.

The association of blindness with so-called benign forms of tabes continued to interest the profession. Pierre Marie, in 1892, differentiated a special superior or cerebral tabes, from the spinal. Buzzard, in 1893, recorded 15 cases of optic atrophy in tabes, four of which were ataxic, and he saw no causal relationship between the degree of the optic and the spinal lesions. A number of similar observations were made, among which may be mentioned those of Babinski, Spiller, Walton, Pearce Bailey and Byrom Bramwell. Mott in 1903, in a monograph which is classical, declared that there were three sites, each of which might be attacked separately by the same specific degenerative process, viz., the spinal roots, the brain and the optic nerve. In spinal tabes, general paralysis and optic tabes the disease process is identical; the disease occurs at one site or another according to conditions peculiar to the attacked individual. " One might as well say that general paralysis halts spinal tabes, as that optic tabes inhibits spinal tabes " (Léri).

But the contention of the causal relationship of the optic lesion and the benign spinal symptoms did not cease during these years. Benedikt grew in optimism. In 1887,[2] in an open letter to

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[2] " Ueber die Prognose und Therapie der Tabes." Offener Brief an Herrn Dr. T. Babinski in Paris, *Wiener Med. Wochenschrift,* Aug. 14, 1887, p. 1130.

" Es ist ein Gesetz von dem ich persönlich bis jetzt absolut keine Ausnahme kenne, dass die specifischen, tabetischen motorischen Erscheinungen wenn sie einen noch so hohen Grad erreicht haben, zurück gehen, sobald die Krankheit mit Sehnervenatrophie eingesetzt hat."

"Ich habe seit dem z. B. einen Fall (Case 399) mit prodromaler

Babinski in the *Wiener Medicinische Wochenschrift,* he emphasized his insinuation of 1881. He trumpeted forth *a law* to which till then he knew *no exception,* that the specific motor symptoms of tabes, no matter to what degree they had attained, would diminish in severity immediately the disease became complicated by atrophy of the optic nerve.

Dejerine and Martin,[3] in 1889, from studying one hundred cases of tabes, eighteen of which showed optic atrophy, concluded that optic atrophy occurring at the beginning of tabes arrests almost always the development of sclerosis of the posterior columns, and at the same time diminishes the sensory symptoms. So far, they state, "la proposition de Benedikt est exacte." But they believed they had demonstrated that once the incoördination is established, blindness does not influence the further course of the disease.[4] Martin, in his thesis published the following year, dealt with twenty-one cases of tabetic optic atrophy and reiterated the views he had already expressed with his master. Raymond tends to agree with Dejerine and Martin. Ingelrans in 1897 supported Benedikt's "law" in its entirety. So did Förster in 1900; and to a greater or less extent so also did Benenati in 1901, and Schupfer in 1901. Since then little has been heard of the "law." No one has troubled to examine it further. But throughout current literature statements occur which reflect either unpublished personal experience, or unverified tradition. Thus Frenkel, in his book on locomotor ataxy, writes: "*Blindness.* In this connection we have to mention two interesting facts which have not yet been sufficiently explained, namely that tabetics who lost their sight at an early stage of the disease seldom developed much ataxia, and that developing blindness is accompanied by a marked improvement of the ataxia already present."

Graham Brown, in his masterly Morison Lectures on Ataxia, states: "In those cases in which early atrophy of the optic nerve occurs with resulting blindness, the maintenance of the power of walking is probably the result of very careful practice and close

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Sehnervenatrophie beobachtet der absolut nicht mehr im Stande war zu stehen und einer Schritt zu gehen, der aber unter entsprechender Behandlung so hergestellt wurde das er jahrelang obwohl total erblindet die complicierSten Gänge in der Stadt machte."

[3] "L'atrophie papillaire survenant au début du tabes arrete presque toujours l'evolution de la sclérose des cordons postérieurs en même temps qu'elle diminue les symptomes d'ordre sensitifs."

[4] "Lorsque l'incoordination est établie la cécité n'influe en rien sur la marche de cette dérnière."

attention" (Second Lecture, p. 15). Analogous expressions from a number of other writers can be quoted.

I propose in this paper briefly to review all the evidence, in order to ascertain, if possible, whether or not the presence of optic atrophy, or blindness, exercises any effect whatsoever upon the tabetic process in the spinal cord or upon the spinal symptoms.

The freedom from pain of the blind tabetic has been stoutly alleged and denied. Pain is a purely subjective phenomenon. For evidence of its presence or absence we are entirely at the mercy of the patient. What the patient alleges may be true or false, or misleading; the physician cannot surely correct or control such evidence. Some patients tend to exaggerate and some to minimize their suffering. Few people will totally deny pain if closely cross-examined. The frequency of confession of a pain which is not really severe will depend upon the stoicism of the patient and the attitude of the attending physician. The data are therefore so unreliable that I do not propose to deal here with the relation of blindness and pain in tabes.

Walking is usually aided by vision. Through vision we obtain information regarding spatial qualities, useful in directing movement. Tabetics instinctively use their eyes in every action; by vision they are reëducated (Frenkel's exercises); hence, to allege that visual loss aids the coördination of movement seems paradoxical and demands the closest examination.

The question whether or not optic atrophy *per se* inhibits the evolution of spinal tabes is confounded with that of the power of blindness to prevent ataxia. The loss of vision in optic atrophy may be detectable only by careful examination of fields; and such loss may be present only in one eye. The appearance of the disc is sometimes valueless as a criterion of the extent of the optic atrophy (Gowers). A disc with marked grayness and small vessels on the temporal half is sometimes associated with little change in vision, and a surprising dimness sometimes occurs with fairly normal-looking discs. But every complete optic atrophy necessarily implies blindness; and the loss of visual acuity, although not an absolute index to the extent of the optic atrophy, is still our best clinical measure of it.

If there is any relation between optic atrophy or the loss of the function of sight, and the retention of the power of coördination, then this relationship should be most evident where the optic atrophy is such as to involve loss of the vision to a degree which precludes all the aid normally derived from the eyes; in other words, when the loss of vision is such that color and form can no longer be distinguished. Optic atrophy in tabes not often advances beyond this point.

Some (Benedikt, Dejerine and Martin) have reported with regard to optic atrophy *per se*; others (Förster, Benenati and Schüpfer) mainly with regard to the resulting blindness. By limiting our enquiry to cases of high grade optic atrophy we shall avoid the confusion which has arisen because of the interchangeable use of the terms optic atrophy and blindness.

We shall also thus include all indubitable cases, and we shall not waste time on cases in which the loss of visual function or the extent of the optic atrophy was perhaps not marked enough to exert any detectable influence such loss may have on coördination.

By what criterion shall we judge the amount of coördinating power? Delicate measurement has been rarely practised in such cases. Usually only a statement of the presence or absence of ataxia is made. Some talk of incoördination, not of ataxia; others use ataxia and incoördination as interchangeable terms. Let us consider only incoördination of such extent as renders walking difficult.

That ataxia is not usually associated with blindness is undeniable. Buzzard's 15 cases comprised only 4 ataxics; Martin's 21, 6 ataxics; Förster's 13, 6 ataxics; and I have notes of 11 cases of tabetic optic atrophy with no or slight ataxia. These same figures show equally incontrovertibly that ataxia and blindness may coëxist in tabes.

Förster found among 58 ataxic tabetics, 6 with optic atrophy; whereas among 27 preataxic tabetics, he found 13 with optic atrophy. But the number of blind tabetics not showing ataxia proves only that ataxia less seldom develops in blind tabetics and does not show that this is because they are blind.

Martin thought the duration of the preataxic stage was an index to the rapidity of the spinal process. He showed that among fifteen of his patients with optic atrophy the preataxic stage lasted as follows:

3 years in 2 cases,
5–10 years in 2 cases,

10–20 years in 5 cases,
20–30 years in 5 cases,
33 years in 1 case.

Förster in 13 of his optic atrophy cases found the preataxic period to be 9½ years; in the 14 which had no optic atrophy, the preataxic period was only 4½ years. Others have also belabored this point; it is indisputable: the preataxic period is longer in blind than in seeing tabetics. But is the immunity from the ataxia due either to the optic atrophy or to the blindness? There is here no evidence of causal relationship.

Förster compared the spinal symptoms in 14 seeing and 13 blind preataxics. He showed that of the seeing, eight had joint loss, of the blind only four; and so with the bladder trouble, loss of knee jerks, etc. If we thus contrast in equal groups of seeing and blind tabetics the severity of the spinal symptoms, do we really prove that the spinal symptoms are ameliorated because of the blindness? I think we do no more than establish that in the chosen groups a certain relation exists between blind and seeing tabetics with regard to the incidence of spinal symptoms. The relation may or may not be wholly accidental; and all that can justly be concluded from such relationship alone is that in optic tabes the chief stress does not fall upon the spinal mechanism.

Can we utilize any measurable sign as an index of spinal implication and contrast those seeing with those blind tabetics in whom we find the same extent of spinal lesion? The best available sign of the spinal involvement is, for this purpose, the extent of the general sensory loss on the limbs and trunk. To find cases where the sensory loss is equal is difficult. Moreover, the general sensory loss is not necessarily an index to the extent of the incoördinating lesion. One may have ataxia without sensory loss, and sensory loss without ataxia. Again the degree of ataxia depends not only upon the extent of the incoördinating lesions, but also upon the degree of the cerebral coördinating power of the patient. This is proved beyond cavil by numerous facts, chief among which are the disappearance of the ataxia under educational exercises, and the variability of the ataxia with changes in mood, in fatigue and other mental states.

The coefficient of ataxia, the measure of the liability to ataxia, is determined by the ratio of what we may loosely style the incoördinating lesions and the cerebral control.

$$\text{Coefficient of ataxia} = \frac{\text{Incoördinating lesions}}{\text{Cerebral control}}$$

To show an influence of blindness upon the coördinating power by this method of comparing the lesions of the blind with the seeing tabetic, we would have first to demonstrate that a blind tabetic and a seeing tabetic had equally extensive incoördinating lesions and equal cerebral power, in other words, had equal coefficients of ataxia, before we could deduce anything from the presence of ataxia in the one and its absence in the other. To assume that the absence of ataxia in the blind was due to the cerebral control of the blind being greater than that in the seeing would be to beg the whole question.

Can we prove anything from ataxia following blindness? Cases of ataxia following blindness are recorded by many. Byrom Bramwell reported a case of a tabetic, blind for two years, in whom ataxia then appeared, and advanced so rapidly that the patient could not stand; among others Martin reported two similar cases, and Léri two. Either there is no relationship between these symptoms or the ataxia occurred in spite of or because of the blindness.

Cases showing simultaneous onset of blindness and ataxia have frequently been reported (Pearce Bailey, Schüpfer and others), and I have myself at present two under my care. They also leave the question of causal relationship undecided.

Can we deduce anything from the disappearance of blindness during ataxia? Here we are on very uncertain ground. Cases of alleged relief of optic atrophy are numerous and some of them are no doubt authentic. But the test of the visual acuity has always been a subjective test. Rare cases are reported in which a long series of reliable tests have been made in order to establish as conclusively as possible that the amount of vision confessed to was the amount actually present, but such reports are by those interested in the vision only, and by them the ataxia is not even mentioned. Gowers published an interesting case in which the vision of a tabetic with evident ataxia was R 1/7: L 1/10: two years later the vision was R 1–3½: L 1–4½: a vast improvement in seeing had occurred, but the ataxia was worse. The degree of the greatest loss of vision here is not great enough to allow us to use the case for discussing the connection of blindness with ataxia.

From a study of the occurrence of ataxia in blindness, and from comparison of ataxia in the blind, and in the seeing, we can reach no conclusion as to the existence of any influence of blindness upon ataxia. Is there no means of clearing up this question? Is there no evidence which is incontrovertible? The only incontrovertible evidence which can be adduced is *clinical observation of the effect of the onset of blindness upon ataxia.* When in ataxic cases blindness supervenes, no question of the extent to which the tabetic lesions affect the cord can arise, for before the onset of the blindness the lesions were such that ataxia had already arisen. The cord lesions were present, the ataxia existed, blindness supervened, what was the result?

There have been cases in which in spite of the onset of blindness a definite and often remarkable improvement in walking occurred. The ataxia has not only diminished, it has disappeared (Förster).

I have already quoted Frenkel and Graham Brown as to this alleged improvement of ataxia with the onset of blindness. Benedikt in 1887 stated, and I cannot find that he subsequently retracted, that he had never yet seen a case in which improvement in spinal symptoms did not occur. His statement implied that he had seen cases in which improvement did occur. I have searched his articles and found only one case. He makes such use of this single case that if he had had others he would have been likely to disclose them. Martin (1890) reports one case of marked improvement in ataxia when complete optic atrophy occurred, but he remarks that remissions in tabes are frequent, and that this isolated example does not suffice to establish a causal relationship between the blindness and the disappearance of the ataxia. He was dealing with a blind tabetic; any example, however isolated, of such a strange phenomenon as permanent remission of ataxia associated with blindness demands explanation.

Inglerans records two tabetic women in Dejerine's service who were definitely ataxic, and whose ataxia disappeared when they became blind. I have not been able to obtain this thesis; my information is derived only from reviews and references.

Förster, in the book from which I have already quoted, describes two cases of ataxia (cases 15 and 19) in which so great improvement followed the onset of blindness that the disease returned to the preataxic stage. In one, the incoördination was evident *in running* only. To demonstrate improvement in such incoördination in a blind tabetic is difficult. The other also is lacking in conviction: this incoördination was evident only in walking in the dark. The improvement when blindness ensued must have been elusive of demonstration.

Benenati (in 1901) reports two cases of ataxia ameliorated by the onset of optic atrophy. The first, a man, had normal vision in the right eye. The improvement in the ataxia is attributed to the complete optic atrophy in the left eye. This case certainly should not be held to prove anything. Loss of one eye in normal life does not influence equilibrium. The other case, a woman, had gray atrophy, but all the information given is: "La vista è molto ridotta in ambo gli occhi."

Schüpfer (1901) in a splendid article reviews the whole question. He reports five cases of improvement in ataxia following the onset of optic atrophy (cases 2, 5, 11, 23, 24). Case 5 he disallows, because he thinks the disturbance of locomotion was due to the onset of blindness. But when these disturbances appeared the patient had still 1/10 vision in both eyes. 1/10 vision is surely not an adequate explanation of "disturbi dell' equilibrio" (p. 253). Three years later "deambulazione ottima, assenza di atassi" (p. 254) is reported.

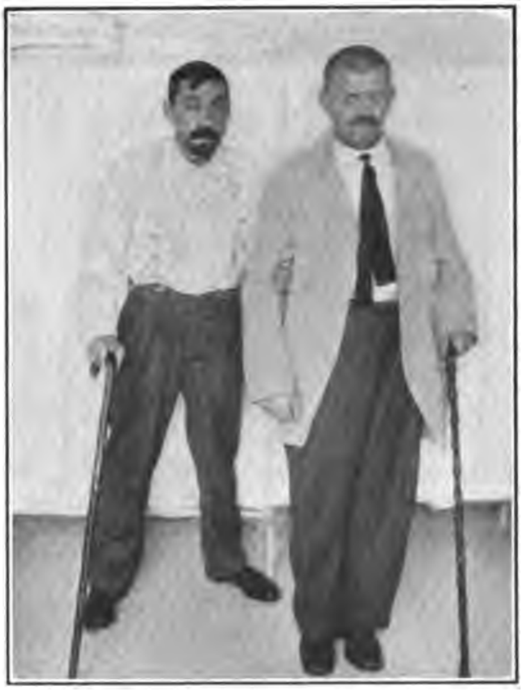
Of the remainder of his 24 cases of optic atrophy only 7, 13 and 22 had high-grade amblyopia: all walked, and had ever walked normally. Cases 15, 16, 17 and 18 had ataxia, but neither blindness nor a high degree of amblyopia.

Léri (1903–4) reluctantly admits two cases (p. 115), but disallows them: one (Harr) was under observation in Bicêtre when his blindness began to develop (1889); he was very ataxic from 1888 to 1890. He, by Léri's own admission, now (1903) walks more as a blind man than as an ataxic. The other (Dupl) had already been blind for two years when a bout of ataxia occurred, which lasted two days. Another bout occurred in 1893–94, much longer in duration, but likewise temporary. In 1904 Dupl was walking well.

Certainly the case of Dupl should be disallowed, but that of Harr must be counted among the cases in which the ataxia improved on the onset of blindness.

I have had one case, a man aged 43 years; pains began at 40; ataxia six months later; vision began to fail about age of 42, first in right eye. Five months after the optic atrophy commenced he could not recognize anything passed before his eyes; visual conditions since stationary; now bilateral white atrophy; can tell light from darkness. Shortly after the blindness began, according to him and his relatives, his walking commenced steadily to improve. He now uses his stick mainly for guidance, very little for support, and can walk well without it.

I am indebted to Dr. Isador Abrahamson, neurologist to the Montefiore Home, New York City, for the following interesting example: Max Krasnow, aged 47. Initial symptoms (1906), lightning pains; numbness of the right leg. Failing left vision six months later, then right eye involved. One year after beginning of eye trouble became totally blind (about 1908). Ataxia began early in the disease (1906–7). As loss of vision increased ataxia increased. Immediately after blindness, walking was very bad. Entered Montefiore Home April 24, 1908. Objective



Dr. Abrahamson's Case. Max Krasnow (Right) formerly very ataxic: now blind but not ataxic, leading an ataxic seeing tabetic.

improvement in ataxia has since occurred; he began to walk better, and now is so steady that he leads other tabetics about, who are not so blind as he is. (See illustration.)

Can we accept the word of the patient, corroborated by friends, regarding the degree of ataxia before and after blindness? The admissibility of this can I think be granted. We usually have no more evidence than the patient's word of the absence of ataxia before blindness or vice versa; and such statements are accepted as veridical. The patient is the best judge of his own walking ability. He tends so rarely to exaggerate his walking capacity that I think Léri's objection to this evidence is not quite justified. But to prevent doubt we shall exclude all cases in which the improvement did not occur under medical surveillance. This exclusion affects Martin's case, one at least of Schüpfer's, and my case.

I think without discourtesy we may eliminate Förster's cases, because of the doubtful amount of improvement in the coördination; both of Benenati's because in neither did blindness exist; and, unfortunately, both of Ingelran's because I cannot estimate their value, as I have not seen his thesis.

I have found cases of ataxia disappearing after the onset of blindness, in which not the blindness but some other cause, such as hot baths, galvanism, etc., was alleged to have induced the improvement. These I have not quoted. Indeed, I am doubtful even of the value of Benedikt's solitary case for that patient at some time subsequent to his blindness received much electrical treatment to which Benedikt attributes some of the credit for the lack of ataxia.

There now remains as indubitable cases in which improvement of ataxia occurred at or subsequent to the onset of blindness three of Schüpfer's, one of Léri's (Harr), and Abrahamson's case—a total of five incontrovertible cases.

We have stated that the liability to ataxia, and the degree of ataxia, depend upon the ratio of the tabetic lesions to the cerebral coördinating power.

The tabetic lesions once established are permanent. They cannot spontaneously disappear. Their tendency is to progress. Even if they remain stationary, their incoördinating power will not lessen. The most which can be expected from the side of the lesions is that the ataxia will not increase.

A patient's ataxia may vary in degree according as he is fatigued or fresh, in pain or in comfort, worried or calm, alone or in company, hopeful or depressed; all these variations in the ataxia occur without any variations in the tabetic lesions. Such spontaneous alterations in the ataxia are essentially transient. They are mere oscillations of the cerebral control: but the daily average degree of ataxia persists and tends to increase. If any improvement other than momentary occur, it must arise from some definite and persistent cause. So long as that cause persists the improvement will tend to be maintained.

Ataxia does not and cannot tend spontaneously to disappear. Any remissions in seeing tabetics which Martin may have noticed must have been transient or due to an accompanying cause which he did not observe. His statement was made before the days when the effect of education upon coördination had been shown by Leyden, Goldscheider, Frenkel and others.

At or soon after the onset of optic atrophy, or of blindness, in these five cases, the ataxia spontaneously and persistently diminished and remained so for a period of months or years. At or soon after the onset of optic atrophy, or of blindness, the normal evolution of ataxia ceased; the ataxia neither increased nor remained stationary, but actually diminished, and this diminution occurred in spite of the fact that the vision which till then must in some of these patients have been a much-used aid to locomotion, was now lost. In the absence of any other ascertainable cause for this paradoxical improvement, we must attribute it to the presence either of the optic atrophy, or of the blindness. Before the optic atrophy and blindness the ataxia could not have spontaneously diminished; it would either have increased insidiously, as is its wont, or have, at least, remained stationary. The seeing tabetic was ataxic; the blind tabetic was less so: tabes plus vision equalled ataxia; tabes minus vision equalled less ataxia or no ataxia.

We must therefore conclude that the presence either of the optic atrophy, or of the blindness, or of both together caused the amelioration in the ataxia.

Benedikt alleges, Dejerine and Martin bring forward proofs, and others assert, that the occurrence of early optic atrophy arrests the progress of the disease in the spinal cord. It is contrary to Hughlings Jackson's principle for a destructive lesion thus to exercise a positive effect.

We now know that tabes is caused by a destructive agent which produces primary degeneration in nerves and which is a byproduct of the action of the Spirochæte pallida. The liability of any part of the nervous system to the attack of this degenerating agent depends upon the resistance of the part. That resistance comprises various factors, among which anatomical structure, hereditary influences and functional stress are chief (Mott). The proneness to tabes might therefore be measured by the ratio of the degenerating agent to the resistance.

$$\text{Liability to tabes} = \frac{\text{Degenerating agent or agents}}{\text{Resistance}}$$ (Strümpell, Schaffer).

Now the presence or absence of optic atrophy cannot in any way affect this ratio. Optic atrophy cannot render other parts of the nervous system either more fragile or more resistant, nor can it increase the amount of the disease producing agent.

Optic atrophy cannot avert spinal tabes. Can it influence the site of the election of the morbid process? We know that the degeneration may first attack the optic nerve, the brain cells or the spinal roots. When tabes begins in the optic nerve, that nerve is presumably the least resistant structure to the disease agent; in other words, it is the structure whose protoplasm has the greatest chemical affinity for the tabetic poison.

If owing to special local conditions the toxin shows a predilection for any one part, so that the first signs of tabes are seen there, it is logical to assume that once the degenerating process has begun, the resistance in that part will gradually diminish as the disease advances. The tendency locally to degenerate will thus become progressively greater, and will increase in relation to the degenerative tendency of other parts. We do not know the biochemistry of the condition, but we may further presume that after the substance which possesses the chemical affinity for the tabetic toxin is destroyed in the affected nerve tissue, then the process there will stop and the site of election will pass to the next most fragile nerve structure.

We know a chemical change occurs in tabes; we know that the optic atrophy may progress rapidly, reach a certain point and remain then stationary. The degenerating substance enters chemically into a combination with lipoid or other constituents of the myelin sheath, so that it is chemically bound in the degenerated material and rendered inert; while the axons tend to persist. If the tabetizing substance is thus used up in degenerating the optic nerve and if no more is available (as seems sometimes to occur, from the abortive form of 33 years duration reported by Förster, and of 45 years reported by Raymond), then the spinal roots will to an unwonted extent escape injury.

If at any time subsequent to, or simultaneous with, the onset of the disease in the optic nerve, the resistance of any other nerve structure falls as low as that of the optic nerve, that structure undergoes the tabetic degeneration at the same rate as the optic nerve. In the event of the resistance of another area falling lower than that of the attacked optic nerve, the process would halt in the optic nerve and proceed in the more fragile area.

Accidental distribution of the degenerating substance probably plays no important part, for we know from lumbar injections that the active circulation constantly continuing in the cerebrospinal fluid rapidly tends to equalize the concentration of the noxious substance throughout the cerebrospinal system. The occurrence of optic atrophy and spinal tabes is thus probably not analogous to the occurrence of say the gonorrheal ophthalmia of infants and the gonorrheal urethritis of adults. Here, the one statistically almost precludes the other; but the preclusion is an accident of the exposure to infection and of the lack of direct communication between the two sites. A closer analogy would be that with the diffusion of a blood infection; anatomical considerations here determine the lodgment—capillaries, terminal arteries, etc.; and inherited qualities and functional stress determine the resistance.

Only in the restricted sense just suggested can the presence of optic tabes influence the development of spinal tabes. In this sense there is nothing mutually exclusive in optic and spinal tabes. Tabes is cerebral, spinal or optic, or any combination of these three. The presence of the disease in the optic nerve has the same influence as the presence of the disease in the cerebrum has, upon spinal tabes, and that is no other than the influence which tabes in one part of the spinal cord exerts upon tabes in any other part of the spinal cord.

No other influence does or can exist. Hence Benedikt, Dejerine and Martin cannot be corroborated in their statement that optic atrophy arrests spinal tabes. The causal inhibition which they allege is merely a passive effect of accidental conditions. The optic atrophy does not arrest or ameliorate the spinal tabes. It cannot, therefore, *per se,* influence the ataxia.

If the presence of optic atrophy does not influence the ataxia, then we must conclude that the improvement in the ataxia conclusively established in the five cases is due to the blindness. How can blindness tend to diminish ataxia? We have seen that no diminution in the tabetic lesions causing incoördination can result from the development of blindness. Blindness cannot raise or lower any threshold of simple sensory impressions. Blindness cannot directly influence the sensitivity of the receptors, the conductivity of the afferent fibers, the clock-like mechanism which governs the simultaneous and successive discharge of the various reflex arcs of the spinal cord; nor can it directly affect any reflex involved in locomotion, whether vestibular or cerebellar, or spinal. How then does it act? It may act in several ways. These ways I may be permitted later to describe. Now I wish merely to refer to the experiments of Slinger and Horsley who tested 22 blind persons, and proved conclusively that the blind possess a "greater muscular and arthrodial sense accuracy" and have a greater faculty of orientation in space. They state: ". . . if the information gained by sight is permanently blotted out, the muscular sense, under necessity can, by education, be brought to a point at least one fourth better than that learnt by the normal seeing individual. In confirmation of this conclusion the plate test showed in a very striking manner that the pupils who were completing the technical training of the college were notably superior in this orientative exercise of their muscle sense compared to those who were just entering on their special education" (pp. 26 and 27).

The claim that blindness may mitigate ataxia rests so far as I know only upon these five cases. One incontestable case would suffice to prove the fact of the beneficent action of blindness upon ataxia. But the cumulative effect of *five* incontrovertible cases has a corroborative value which far exceeds that which estimate by arithmetical or even geometrical progression would confer. These five cases establish absolutely that blindness increases coördination, that blindness mitigates ataxia. We have quoted Slinger and Horsley to show that this action is not peculiar to blindness in tabes; a precisely analogous enhancing of coördinating power occurs in the nontabetic blind.

This beneficent coördinating delicacy which follows blindness has been very elusive. We have been able to establish only five incontrovertible cases of its presence. Why is the evidence of this so rare? E. Mendel noted only 21 cases of blindness in 288 tabetics; and Kurt Mendel and Tobias 36 cases of marked atrophy in 430. In 718 tabetics a high degree of optic atrophy occurred only 57 times. Blindness therefore affected not more than 7.9 per cent. of these cases; probably less. In Martin's 21 cases of blindness, the blindness followed the ataxia only once; in Léri's 40, thrice; in Schüpfer's 24, once. Hence in 85 blind tabetics, blindness followed ataxia 5 times, that is, in about 6 per cent. If blindness follows ataxia in 6 per cent. of blind tabetics and 7.9 per cent. of tabetics are blind, then the possibility of observing the effect of blindness upon ataxia occurs only in 6 per cent. of these 7.9, that is, in 0.47 per cent. of all cases of tabes. These figures do not pretend to any absolute value; they are quoted mainly to show how rare is the opportunity to observe the effect of blindness on ataxia.

Moreover, Mott claims that 50 per cent. of optic atrophies subsequently develop general paralysis. So the opportunity for observing the improvement occurs probably in less than 0.24 per cent. of the cases of tabes.

This essential rarity explains in part the fewness of the clinical observations which I have been able to collect in support of the causal relationship between optic atrophy or blindness, and the amelioration of ataxia. To duplicate these five incontestible cases, at least 1,440 cases of tabes would need to be examined. The scarcity of the evidence is not due to the exceptional nature of the fact which it establishes, but to the rarity of the cases which afford incontrovertible proof of that fact.

Once a fact is incontrovertibly established, evidence bearing upon it which hitherto has been open to suspicion then acquires an enhanced value. We, having established the fact of the coördinating delicacy which arises when blindness develops, may now adduce as further evidence of it, the cases of Martin, Schüpfer and myself, which we earlier disallowed, because they rested only upon report. The many cases, including Benedikt's, in which some other agent was alleged to contribute to the disappearance of the ataxia must now acknowledge the beneficent action of the blindness, also.

In proving that these blind tabetics were less ataxic because they were blind, we have also proved that, *ceteris paribus*, any tabetic who is blind will be less ataxic than another who sees. Hence, we can now affirm that the long preataxic stage of the blind is not solely an accident of localization of the tabetic lesion in the optic nerve, but may also be due in part to the blindness. That, in other words, the blind tabetic tends to remain preataxic after his spinal lesions have passed a point at which a seeing tabetic would have become ataxic.

Again, the mildness of the sensory symptoms recorded by Förster in the group of blind tabetics which he compared with seeing tabetics, was in part due to the greater discriminating power of the blind, in part to the localizations of the lesions. He found loss of touch, a perception demanding no discrimination approximately equal in both groups. Joint sense appreciation demands discrimination between the new and the last posture; it is a cortical function, and eight of the seeing showed joint sense loss, but only four of the blind.

I regret I cannot more fully discuss this matter; but the data afforded by most of the writers do not permit elaboration of the proof. I think, however, I may now claim in support of the retarding action of blindness on ataxia, the generally conceded observation that ataxia is rare in the blind.

I have refrained hitherto from discussing the relation between ataxia and degrees of loss of vision less than blindness. What I have tried to establish so far only for the blind tabetic must hold true for every tabetic in whom vision has deteriorated to an extent which permits unusual recourse to other senses. Those reported cases of optic atrophy which did not become blind, and yet were accompanied by improvement of ataxia (Schüpfer's cases 5 and 23) depended for that improvement on the same causes which determine the improvement in those totally blind. The same principle prevails: the less vision monopolizes attention, the less the distraction, the more perfect is the discrimination of sensations from other spheres. In cases, however, where in both, or even in one eye, vision enough for ordinary purposes persists, the tendency will usually be to devote still more attention to the failing vision.

The rate at which the blindness occurs must play an important rôle in the immediate result upon coördination. If the blindness occur very quickly, its first action may be to increase ataxia (see Abrahamson's case), because of the depressing mental effect of the blindness and of the chaos of movement produced by the sudden combination of blindness with ataxia. Such an increase of ataxia will, however, be temporary.

There are cases where blindness occurs, and the ataxia persists. In these cases the ataxia may either remain stationary or it may increase. When it remains stationary, we may in part thank the blindness. The beneficent action of the blindness must then be adequate at least to balance the natural tendency of the ataxia to increase. If the coördinating lesions increase, the effect of the blindness will or will not be evident according as the increase in the lesions produces a lesser or a greater incoördinating influence than the blindness can compensate.

If the tendency to amelioration equal such adverse forces, then no detectable influence will be discovered upon the ataxia; if it be less than such forces, then by so much as it is less will the ataxia tend to increase.

A permanent advance of the ataxia may, however, be due not only to a rapid increase in the tabetic lesions, but also to mental changes accompanying the disease, which preclude the beneficial psychic effect of the blindness. In this connection I may again refer to Mott's statement that 50 per cent. of optic atrophies develop general paralysis.

Conclusions

I. (*a*) Neither the occurrence of optic atrophy nor of blindness retards or influences the evolution of the structural changes which accompany the tabetic process in the spinal cord and elsewhere. The absence of spinal implication in primary tabetic optic atrophy is due to the accident of the localization of the morbid process, and not to any inhibitory influence arising from that localization.

(*b*) The law governing the distribution of the tabetic lesions is as follows: If special fragility exist at any site, and the amount of the tabetic poison be limited, then the site of election for the initial process is the fragile part and it will be the main site of the disease; if no special fragility be present, the disease will be diffuse; if special fragility occur and a large amount of tabetic poison be present, then the fragile is the primary site of the process which later will become generalized, spreading from part to part in the order of the least resistance.

II. The action of a diminution in visual acuity upon ataxia may be postulated as follows:

1. Improvement in ataxia will result from a lack of vision after an adequate interval has elapsed:

(*a*) When incoördinating lesions remain stationary; and the mental capacity for training is not destroyed by cerebral disease.

(*b*) Even if the structural tabetic lesions leading to incoördination extend, provided that the effect of this extension be less than the compensating influence of the blindness.

2. No change in the ataxia will follow loss of vision if the advance of the incoördinating lesion just neutralizes the beneficial influence of the blindness. Obviously this stationary phase can be but temporary.

3. Increase of ataxia in spite of the blindness arises:

(*a*) When the incoördinating lesions advance faster than the coördinating tendency of the blindness grows. Here increase in other morbid signs (spread of sensory and visceral affections) will show the progress of the ataxia to be merely one expression of a general advance in the tabetic spinal lesions and will serve to distinguish it from

(*b*) When blindness is accompanied by cerebral deterioration of such extent as precludes training, and prevents improvement, Mott's conclusion that fifty per cent. of early optic atrophies develop general paralysis is interesting as affording a possible explanation of many of the cases of this class.

III. The law of the relation of loss of vision to ataxia, if it can be dignified as a law, should read: *Ceteris paribus,* of two tabetics, at any stage of the disease, one blind, the other seeing, the blind has the greater tendency to persist coördinate, the lesser tendency to become ataxic.

The degree of this compensatory improvement in the power of coördination will, *ceteris paribus,* tend to rise with the duration of the blindness (see Slinger and Horsley's observation upon those beginning and those ending their training, and Dr. Abrahamson's case), according to the training capacity of the person.

For two years now I have been applying to the cure of ataxia the method of enhancing sensory perception which the blind teach us. At the International Extension Course at Fordham University in September, 1912, and subsequently at the New York Post Graduate Medical School, I showed cases of ataxia cured by myself and by Dr. Wachsmann by this method. The blindfolded tabetics can quickly be taught to appreciate their surviving postural and muscular sense impressions to such a degree that hopeless bedridden ataxics quickly learn to walk again. Moreover, the degree of improvement obtained by my method seems to me greater than that I used to get from Frenkel's exercises. I shall in a subsequent paper fully describe this new mode of treating ataxia.

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NOTE ON CONTRALATERAL OPPENHEIM AND GORDON REFLEXES, WITH OBSERVATIONS IN TWO CASES[1]

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Summary of First Case.—A colored man, aged about 50, in delirious state most of the time in hospital, having retention of urine, paralysis of both legs, jerky twitchings of all four extremities, increased reflexes with ankle clonus, marked tenderness and with spinal fluid findings indicative of ventricular involvement, presented some hitherto undescribed contralateral Oppenheim and Gordon reflexes; no Babinski. Died; no postmortem examination obtained.

Case History.—The past history of the patient is only vaguely known, since it was obtained from a friend whose acquaintance dates back but five years. He is known to have been a heavy drinker in his youth but for at least five years has been very temperate. He was married: had no children. For eighteen months his wife has been in the Boston State Hospital, with a condition diagnosed as paranoid. For a long time he has been unable to hold his urine for over an hour at a time, but aside from that he complained of no symptoms: no pains, aches, dizziness, paralysis or attacks of any kind.

The present illness starts with the retention of urine, symptoms just the opposite to his usual condition of incontinence. Following this, he began to grow weak; later became confused and in about two weeks was helpless and quite demented. He was brought to the Psychopathic Hospital on January 10, 1913.

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[1] Being Contributions of the Psychopathic Hospital, Boston, Massachusetts, Number 22 (1913.22). (*Bibliographical Note.*—The other contribution was "Notes on Sunlight and Flashlight Pupil Reactions and on Consensual Amyosis to Blue Light," 1913.21, by Drs. Myerson and Eversole to be published in the JOURNAL OF NERVOUS AND MENTAL DISEASE.)

Examination at Time of Entrance.—He is in very marked delirium: talks, sings and prays. Does not answer any questions put to him: is apparently completely oblivious to his surroundings. Circulatory system: The heart area increased somewhat to left and downward—rather rough systolic murmer, heard best over aortic area, transmitted upward. Arteries not remarkable. Lungs negative. The bladder is distended to above umbilicus; otherwise, the abdomen is negative. Nervous system: Occasionally moves his arms, left more than right: legs, no movement, except occasionally there is jerky twitching which involves the arms as well and is most marked on right side. No foot drop. Reflexes: The arms, right slightly greater than left, both very lively. Right knee jerk and right ankle jerk greater than left, all very active. Adductors very active, homolateral and contralateral. Ankle clonus on right not constant but sometimes obtained for twenty or thirty rhythmic jerks in succession: slight clonus on left. The great toes held somewhat dorsiflexed.

No Babinski obtained at any time. Stimulation of right tibia (Oppenheim's method) produces homolateral Oppenheim and contralateral Oppenheim, that is, great toe moves upward on both sides.

Stimulation on left tibia,—only homolateral Oppenheim.

Stimulation of right tendo-Achillis (Gordon's method) produces homolateral and contralateral extension of great toe.

Stimulation of left tendo-Achillis brings about only direct great toe extension: that is, only homolateral response.

Legs at this time slightly tender.

Course of Illness.—For a short time three days after entrance patient regained consciousness, but otherwise he remained in delirium till the end.

The bladder was catheterized twice daily with great difficulty; about 3,000 c.c. were secreted each day of practically negative urine. On the last day of illness no urine was passed and bladder was not distended.

Twitchings, paralysis, increased reflexes and ankle clonus persisted until six or eight hours before death. The tenderness in his legs increased very markedly until even in his most stuporous state the lightest touch would set him screaming as if he were agonized with pain.

The great toe phenomena remained as above described except that at times it would be possible to obtain a right Oppenheim or Gordon response from the left leg; usually, however, only the left side responded to contralateral stimulation.

Lumbar puncture on January 14. Fluid slightly cloudy; centrifuge specimen did not change in appearance; no fresh blood but many red blood cells in fluid; no lymphocytosis, no globulin increase. Wassermann reaction in spinal fluid and blood, negative.

No fever at any time. Patient bled from nose and mouth on January 14. Died January 15, five days after entrance.

No postmortem examination being permitted, the exact diagnosis of the condition described cannot be made. The marked disturbance in consciousness, the retention of urine, the increased reflexes particularly on one side, the ankle clonus, the jerky twitchings of the extremities, together point unmistakably to a cerebral lesion, and the spinal fluid findings make this almost certain. The remarkable tenderness makes it necessary to exclude neuritis and this can be done because of the signs that point to a cortical neurone disturbance—that is, clonus and increased reflexes—while the absence of any history of alcoholism helps exclude a multiple neuritis of that type. The slow onset and the progressive character of the trouble indicate a thrombus that may have involved the thalamus.

Summary of Second Case.—Male, 62, having symptoms that pointed unmistakably to cerebral arterial lesions, showed on one side homolateral and contralateral Babinski, Gordon and Oppenheim, on the other side homolateral Oppenheim and Gordon.

Case History.—The patient's family history was unimportant. His past history until lately had no bearing upon present condition. For past three months he had been very forgetful, confused and at times actually demented. On May 20, the day before admission, he wandered away from home. The family believed he had a "stroke" at the onset of his illness.

Examination at Time of Entrance.—Emaciated. Arteries show usual signs of sclerosis, the heart area is normal but the sounds are weak and distant. Respiratory system negative. Digestive system negative. Nervous system could not be examined with exactness, because of patient's resistance and dementia, but right side of face was smoother than left, right knee jerk greater and there is patellar clonus on that side. Pupils and Babinski cannot be tested. Mental state, dementia and confusion. Wassermann reaction in serum negative, spinal fluid negative to serum, cells and globulin. Some increase in albumin. Sugar, negative. Urine not obtained.

Course of Illness.—On the 2d of June he became unconscious and it then became possible to examine him thoroughly.

The eyes were turned to the left, pupils reacting slightly to light. The right arm reflexes were more active than left, very active on both sides. Marked adductor spasm of both legs, greater on right. Right knee jerk greater than left, right ankle jerk greater than left, bilaterally active, however. Abdominal and cremasterics absent on right, slight on left. No ankle clonus or patellar clonus.

On right, Babinski, Gordon and Oppenheim from homolateral and contralateral stimulation.

On left, no Babinski, Oppenheim and Gordon present from homolateral stimulation, not elicited by contralateral stimulation.

Patient recovered consciousness in few hours, but died three days later of bronchopneumonia.

The cases of crossed or contralateral great toe phenomena have been described by several authors; notably, Bramwell, Knapp, Klippel and Weil, Sternberg and Fairbanks. The most common pathological form is that where with Babinski present on the paralyzed side, stimulation of the opposite sole brings about the flexor or normal reflex on the paralyzed side; that is, the Babinski response is changed into a flexor response by stimulation of the opposite sole. Fairbanks has enumerated all the other pathological forms, which may roughly be stated to be: first, where the stimulation of one sole brings Babinski on the opposite side; second, where stimulation of one sole brings Babinski on both sides; third, where with no Babinski present on either side further stimulation of the corresponding soles, stimulation of the opposite sole will elicit a Babinski response. This remarkable phenomenon, first described by Fairbanks, was observed in his case by the present writer.

While contralateral Babinski phenomena have been described, no mention is made in the literature of contralateral Oppenheim and Gordon responses. The first case here reported is not only unique but gains added value in that no *Babinski* was present, for while it is well recognized that Oppenheim's and Gordon's signs are only means of eliciting great toe extension from sites different than that described by Babinski, it is not commonly recognized that these may occasionally be present where Babinski is absent. This latter fact is exemplified in the second case. While *Babinski* more frequently occurs alone than either *Oppenheim* or *Gordon,* their appearance even without Babinski means organic disease of the cerebral motor neurone, and therefore they merit inclusion in the routine neurological examination.

It is interesting to observe that in the first case under consideration the contralateral response occurred more constantly and typically on the side apparently least affected. This fact brings these responses into line with the oft-observed phenomenon that the great toe extension has no absolute parallelism with increased reflexes, clonus, paralysis and other manifestations of cerebral neurone affection.

As for the pathogenesis of contralateral great toe phenomena, including in this term *Babinski, Oppenheim* and *Gordon,* there are no satisfactory explanations. That the direct *Babinski* of babies represents a spinal reflex which becomes changed into a flexor reflex under the influence of the higher, probably cerebral, centers is the position generally taken. With the injury to the pyramidal tract the spinal reflex reappears—the *Babinski, Oppenheim* or *Gordon* of disease, but the contralateral response is explained only when one evokes tracts and fibers not yet described by the neuroanatomist and the neuropathologist—such as hecatomeric sensory fibers with one process passing to the bulb and the other to the opposite anterior horn cell (Knapp's explanation), or the conception that the so called direct pyramidal tract has at least part of its fibers uncrossed throughout their course (Fairbanks, etc.). All one can really say is that in view of the many variations of response that may and do occur (see Fairbanks) there may be no absolute uniformity of nerve inter-connections or a more excitable nervous system; and in some cases of disease, the bilateral response or the contralateral may be a necessary result of the individual's original nervous make up.

Whatever be the pathogenesis of these responses, experience shows them to be much more common than the rather scanty literature implies. Moreover, they may in certain cases, as in that of Fairbanks and the one here described, be the only great toe signs present, and thus acquire the peculiar importance of the typical reflex.

LITERATURE—CONTRALATERAL OPPENHEIM AND GORDON REFLEXES

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PSYCHIC EPILEPSY OCCURRING WITHOUT OTHER EPILEPTIC PHENOMENA[1]

By George E. Price, M.D.

Epileptic psychic equivalents occurring as the only manifestation of the disease are sufficiently infrequent to warrant the report of the following case:

The patient, a male; aged 42 years; American; foreman by occupation; was referred to me by Dr. H. D. Fraser.

The family history is as follows: Patient's father died of a gastric tumor following an accident. His mother is living and well. One brother died of tuberculosis; one brother is living and in good health; one sister is living but has kidney trouble. A maternal grandfather died in an insane asylum. There is no history of epilepsy occurring in any member of the family.

The previous history of the patient presents no features of interest except with regard to his general nervous characteristics and the factor of exhaustion from overwork. He had malaria when fifteen years old. Venereal infection is denied, also the use of alcohol and tobacco. He has never had convulsions, not even the "spasms of infancy." He is married and has one child in good health.

For several years preceding the onset of his present illness he had taken no vacation, although holding a responsible position and working very hard. His wife states that he had been "running down" for six months prior to his first attack, having been very irritable, losing weight and complaining of horrible dreams at night. On coming home from business he would manifest great fatigue, often retiring almost immediately after the evening meal. During his whole life he had been irritable and the possessor of a violent temper.

The present condition commenced the second week in September, 1912. During the evening the patient's wife heard him snapping an empty revolver in an adjoining room. On entering the room she found her husband confused and entertaining the delusion that a man was in the room whom he was apparently trying to shoot. In less than an hour his mind cleared and he had no recollection of what had occurred. He then complained of headache and wanted to sleep. Between this time and October 24 he had seven other attacks, all occurring at night. No one saw him at the onset but he would be found confused, hallucinatory and delusional, always believing a strange man was in the room and entertaining in a more or less vague way the delusion of marital infidelity. The attacks lasted from fifteen minutes to an hour and were always followed by headache. His wife stated that she could usually tell the evening before her husband had an attack of its imminence, as he would appear somewhat dazed and unresponsive, though not confused. There was no biting of the tongue nor voiding of the urine and the bed clothing was not disarranged as after an epileptic convulsion. Subsequent attacks have been observed at the onset and in several at least he would wake suddenly from sleep directly into the confused state. On one occasion, he got out of bed and wandered about the house apparently seeking the imaginary man. At no time has he been dangerously violent, although upon several occasions he has been "somewhat rough" with his wife, to use her expression. Some of the spells have been of brief duration, one lasting only two minutes. They usually last from fifteen to forty-five minutes, none having been over an hour. There is no recollection of the happenings of the attack by the patient when in his normal condition.

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[1] Read at the meeting of the Philadelphia Psychiatric Society, May 9, 1913.

A physical examination was made October 24 and found negative except for a double pseudo-ankle clonus and increased knee jerks. There were no hysterical stigmata. Urinary and blood examinations were negative. An ophthalmological examination was made by Dr. Shannon, who reported the ocular conditions normal.

Following this date, October 24, the patient became much worse, having one or more attacks nightly. He was then kept under observation in the Jefferson Hospital for a week and subsequently placed under full rest treatment with free use of the bromides.

While he was in the hospital, several attacks were reported by the night nurse. In one of these he started up suddenly in bed and declared there was a man behind the door whom he wanted to kill, that his wife was downstairs reading and he insisted upon having her called. In fifteen minutes he became rational and complained of severe headache. Upon another occasion, he got out of bed and threw his ice cap at the imaginary man behind the door.

Under the rest treatment and bromide, the attacks subsided and he improved physically so that after several months of freedom from the attacks he was allowed to return to business with the result that the spells again appeared. They now, however, pertained to people and incidents connected with his work but otherwise presented the same features that characterized his former lapses.

I should add that during all of the attacks the patient's face is suffused. This is so marked that the nurse said he could tell upon entering the room, from the color of the face, whether or not his patient was having an attack. The essential features of the attacks it will be noted are the clouding of consciousness, disorientation, hallucinations and delusions assuming the same general form; amnesia which appears to be absolute; the automatic character of the acts and the subsequent headache and somnolence.

These facts, I believe, warrant the assumption that the spells are epileptiform in character, even though a history of epileptic convulsive attacks is wanting. While there is no mental disorder peculiar to epilepsy, the varied character of the psychic disturbances that may result in this disease together with the relation they bear to the convulsive attack, makes the subject one of considerable interest.

In relation to the convulsion we have either delirium, confusion or stupor, some one of which may precede, replace or follow the motor attack. If the epilepsy has been of long standing with frequently repeated convulsions, a dementia may ensue. Feeblemindedness is a frequent accompaniment of epilepsy and must not be confused with the dementia which is a progressive mental deterioration, while the feeblemindedness is part of a developmental arrest.

When the mental disorder replaces the convulsion it is termed masked or larvated epilepsy and is easily recognized when alternating with true motor attacks. When occurring as the only manifestation of the disorder, it is obvious that it would present more difficulty in diagnosis. The determination of the condition rests not so much upon the character of the mental symptoms, which may be varied, as upon the mode of onset, duration and termination, combined with the history of the case and the association with other epileptic phenomena. The attack may take the form of a brief, violent delirium or a more prolonged confusion or dream state, the so-called ambulatory automatism.

Unlike the ordinary form of delirium or confusion, the onset of the epileptic psychic equivalent is abrupt—like the onset of a convulsion. In the case recorded above, the man was thrown abruptly into one attack by being startled at the sudden snapping of the key to an electric light bulb. This suddenness of onset is one of the distinguishing features. The termination of the attack is usually characterized by headache and somnolence. De Fursac considers this "stupor" as he terms it, as being almost pathognomonic.

The symptoms of the psychic equivalent range from a violent delirium with frightful hallucinations to a simple automatic continuance of the patient's occupation at the time of the onset. Thus a man may walk for several blocks or drive a team a considerable distance without any subsequent recollection of the occurrence. Often the convulsion is replaced by a sudden instantaneous impulsion, as to commit some obscene act, to kill or to destroy, each succeeding attack being apt to resemble the original impulsion. These acts may appear purposive but almost invariably there is no recollection of what has transpired during the period.

Consciousness, if not entirely lost during the attack, is profoundly clouded. Amnesia is usually absolute although there may be a vague recollection of some of the acts performed during the period of the attack. Salgo compares this recollection of the epileptic attack to the memory of a dream.

Epileptic psychic equivalents must be differentiated from hysteria, neurasthenia, transitory confusion occurring in chronic alcoholism, etc. In hysteria, the sensory stigmata or characteristic motor attacks are usually present and the somnolence after the attack would be lacking. It must not be forgotten, however, that hysteria and epilepsy may coexist in the same case.

The prognosis of psychic epilepsy is that of epilepsy in general and the same may be said regarding the treatment. In the above case, the attacks were absent for a period of three months, although at one time occurring nightly; seizures reappeared when the patient returned to business. The "interval" followed rest measures combined with full doses of bromide.

The medicolegal importance of psychic epilepsy is obvious, as an epileptic may come in contact with the law through the performance of an act apparently purposive in character, yet during which he would be unconscious and of which he would hold no recollection.

An interesting case of psychic epilepsy occurring without a history of any convulsive attacks was presented before the Philadelphia Neurological Society in 1899 by J. Norman Henry (JOURNAL OF NERVOUS AND MENTAL DISEASE, 1899, p. 362). This patient, like the one recorded above, was a man of middle age, whose attacks cleared up for a period of seven months at least under the administration of bromides. McCarthy (JOURNAL OF NERVOUS AND MENTAL DISEASE, 1900, p. 143) also presented a case of psychic epilepsy before the Philadelphia Neurological Society; this patient, however, had spasms in infancy and in one of his later psychic (ambulatory) attacks the head was turned to the left and the eyes turned up and out.

REFLEX FREQUENCY AND ITS CLINICAL VALUE[1]

By Walter B. Swift, M.D.

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Very little clinical observation exercised in casual visits to neurological out-patient departments convinces one that there has been no special reason why any certain series of reflexes should be taken, or why a series should be followed at all. The reflexes have come into use, apparently in a chronological way, those first discovered heading the list, and those described later following in order. Several along the line were omitted because presented in a foreign language, or not pushed to the front by their discoverers, or published in some obscure magazine. Thus the present procedure of following a series is vaguely chronological. The scientific method would naturally be to take those reflexes first which occur most frequently, and then run down the line of frequency as far as necessary in a given case to secure the diagnosis. We shall, therefore, try to establish a reflex frequency and show its value in clinical examinations.

What I now present consists in a statistical tabulation of reflex data collected from normal and pyramidal tract cases from numerous clinics during the last five years, and amounts to the presentation of the result that follows from the tabulation of some two thousand observations of the reflexes.

There are in all ninety-one cases. Because of incomplete tabulation, or from doubtful diagnosis, or because of the need found to add several other reflexes, as time passed, twenty-nine cases of these ninety-one must be excluded from our present use except as they supply details incidentally needed. Another thirty-two cases remaining are reserved for a later presentation.

The remaining thirty cases show pathognomonic signs of pyramidal tract involvement—history, spasticity, exaggerated and pathological reflexes. Of these I have thought it best to exclude two cases of multiple sclerosis because they showed (1) extremely sensitive stimulation areas, and (2) because with the neurons unattacked, they could not rank as true tract lesions. A third case of insular I have excluded on the latter ground alone. One other case, dementia paralytica, spastic type, I must exclude because of incomplete tabulation. From this, are left twenty-six different cases of pyramidal tract lesion; seven of these being double cases—paraplegic—and counting these each as two cases, makes us thirty-three different cases in the series to be considered.

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[1] Read November 21, 1912, to the Boston Society of Neurology and Psychiatry.

We will proceed, then, with thirty-three unquestionable cases of pyramidal tract lesion. Upon each of these cases the same series of some forty reflexes and signs were tabulated. The work was begun with no preconceived ideas as to the outcome, for no comparison was made as a basis for conclusion until the full series was completed. A uniform technique and uniform judgment as far as possible have been followed, and results tabulated irrespective of any previous tabulation. Thus, the method of collection and the tabulation must be free from any conscious bias.

My first step was to retabulate the presence of pathological reflexes in a series of relative frequency, in order to determine which reflexes occur most often. From this tabulation I find the following series results:

ORDER OF FREQUENCE

Leg	
Knee jerk	26
Babinski	22
Rossolimo	21
Marie	18
Strümpel	18
Chadduck	17
Mendel-Bechterew	16
Trummer's Babinski	14
Gordon leg	14
Trummer's Oppenheim	13
Oppenheim	12
Ankle clonus	11
Trochmorten	11
Trummer's	9
Patella clonus	8

Arm	
Jacobsohn	19
Weil	8
Wrist	7
Triceps + +	7
Gordon arm	0

The New Alignment.—One naturally looks at this list to find the presence of the usual list of reflexes taken in ordinary routine clinical examinations—knee jerk, Babinski, Oppenheim, ankle-clonus, but we find here an entirely new and unexpected alignment, the alignment of *relative frequence.* At the top we find knee jerk, and Babinski stands next. Then where we would naturally look for Oppenheim or ankle-clonus, or perhaps Gordon, we find that all these are placed far down the line, and that next comes Rossolimo with 21, and then Marie with 18, followed by Strümpell 18 and Chadduck, with 17; then Mendel-Bechterew with 16, and after Trummer's Oppenheim, Gordon, Trummer's Gastrocnemius comes our Oppenheim with 12, ending with ankle clonus, Trochmorten, each with 11, Trummer's with 9 and finally patella clonus with 8.

As far as the arm is concerned the Jacobsohn leads the list with 19. Far behind come Weil, with the usual increased arm reflexes, and Gordon of the arm, as far as my own observations can go without a single occurrence in all these thirty-three cases.

Clinical Value.—Looking then to the clinical significance of this series, with an eye to choosing for the routine examination enough reflexes or as few as will make the examination safe, we can proceed as follows: Patella clonus, Trummer's, Trochmorten's and ankle clonus occur so infrequently that their need is very questionable. Just where one should stop in going up the line it is impossible to say. For one reason, because it is a question just how many reflexes are necessary when pathological to clinch a diagnosis; how many others a man would need to take in order to bolster up the others, and just how few would be necessary to be sure to strike every case of pyramidal tract involvement. I think perhaps we might omit the Chadduck reflex because it is rather painful; Repeatedly have patients objected to my trying it. This also is true of Marie, and if anything, more so, for the tense pain caused by the forced flexion of the toes that is necessary to elicit this reflex seems quite uncalled for in routine clinical examinations in face of the fact that there are so many other reflexes. We have then nine left, if we begin at Oppenheim and include those above.

If we start from the top of the list now and study them downward, we find that a real exaggerated knee jerk is *often* a doubtful matter, and surely such an observation should be checked up by more reflexes than a Babinski, because a Babinski, as the observer of it himself has said, can easily be simulated, although this is less likely to occur in this country than it is abroad. The other newer reflexes, that come next in order, do not yet inspire the confidence that we still have in our old friends, so that for the present I should say that the whole list down to Oppenheim should be included in each routine examination until a more exhaustive series can be presented showing that some of these are unnecessary. We have then the following list for routine clinical examination:

Leg

1. Knee jerk.
2. Babinski.
3. Rossolimo.
4. Strümpell.
5. Mendel-Bechterew.
6. Trummer's Babinski.
7. Gordon of the leg.
8. Trummer's Oppenheim.
9. Oppenheim.

Arm

1. Jacobsohn.
2. Weil.
3. Triceps.
4. Wrist.

Here the question may naturally arise: Is this list valid for both sides, or must there be a right and left series, very naturally suspected as a result of some difference in muscle development, in some internal cord cellular variation, or predominance in function of one side of the cortex. To throw any objection like this out of the question I have arranged the same series of cases with lesions on the right and left. To make the matter even, I have put an equal number of cases on both sides thus:

COMPARISON OF FREQUENCE ON RIGHT AND LEFT

Leg

	R.	L.
Knee jerk	12	13
Babinski	10	11
Rossolimo	11	8
Marie	8	9
Strümpell	8	9
Chadduck	10	9
Mendel-Bechterew	8	6
Trummer's Babinski	6	8
Gordon of the leg	8	7
Trummer's Oppenheim	5	8
Oppenheim	7	6
Ankle clonus	5	6
Trochmorten	5	6
Trummer's	5	4
Patella clonus	4	4
	112	114

Arm

	R.	L.
Jacobsohn	8	9
Weil	3	4
Triceps	3	3
Wrist	2	4
Gordon arm	0	0
	16	20

Conclusion from this Side to Side Summary.—We have then in the leg of thirteen cases 112 reflexes on the right against 114 on the left, and in the arm 16 on the right as against 20 on the left. We may conclude therefrom that whether a lesion is located on the right side of the body or on the left side of the body, the number of the reflexes occur approximately the same. As far as my personal observation goes, the comparative activity shows a commensurate intensity. We may therefore conclude the above list is valid for both sides.

It is due to complete fairness to note the slight difference in the sums of the above reflexes. This difference shows that the reflexes controlled by the left side of the brain are slightly less than those controlled by the right side. Perhaps the increased function of the left hemisphere may in some way exercise that much inhibition in both arm and leg.

Lesions, Early and Late.—The question may naturally here arise as to whether age of the lesion should in any way vary the series, and under this head it seems at present necessary to consider one reflex only, where a claim of its occurrence in early lesions has been brought forward as one of its chief advantages. I refer to the Gordon reflex of the leg. In regard to this reflex, I found in my series the following occurrences:

New Cases	*Old Cases*
Lesions of 3 weeks ——+	
Lesions of 3 months—+++	Lesions of 2 years +
Lesions of 2 months—	Lesions of 3 years +
Lesions of 5 months—	Lesions of 6 years +
Lesions of 6 months—	Lesions of 44 years +
Lesions of 10 months+	

Of lesions immediately after the onset I have too few to be worth tabulating, but as far as the above fairly early lesions and the very old lesions are concerned, I find no evidence to vary the series because of any exclusive occurrence of the Gordon leg reflex in early lesions.

The Infantile Form.—The question here may naturally be raised as to the infantile form of reflex response to various areas of stimulation.

Up to this time I have considered a few cases, and as far as that consideration goes I find that the flexor response to plantar stimulation is the only reflex that is changed in early life. In our series, then, adapted to infantile cases before the period of walking, I should say that the same series could be followed with the Babinski reflex omitted.

To clear this subject up without any question needs quite an exhaustive investigation of this same series of reflexes not only in normal life but also in pyramidal tract cases in order to surely exclude any conditions that might have been present in these few cases of infantile that I have examined. This series I have already begun, to report at length upon later, and I therefore wish here merely to state that the above conclusion as to the infantile form is tentative.

It is of interest here to search about to find the background that stands as cause of this reflex frequency. We will under this head, therefore, consider the following causes:

1. Distance of sensory and motor neuron from the cord.
2. Relative development of muscle.
3. Relative weight of the part moved.
4. Relation of the subjective sensitiveness to the stimulation area.
5. Comparison of skin and tendon reflexes.
6. Comparison of heights in the cord.

1. *Relative Frequency as Related to Distance from Cord.*—In our list we noticed that the knee jerk is the nearest to the cord and is the most frequent, but we find that the next one in frequency, the Babinski, is elicited by a stimulus farthest from the cord. Rossolimo, the next, is also a foot reflex. Then we notice as a whole that stimuli about the foot, except Trochmorten, are higher up than reflexes about the lower leg. Therefore, we may conclude that as to distance from the cord having any constant relation to reflex frequency, it is not the case.

2. *Relative Development of Muscle.*—Here we can compare leg extension (K. J.) with

(*a*) Toe extension.
(*b*) Toe flexion.
(*c*) Ankle clonus.

If size and strength of muscle are related to frequency, then leg extension and ankle clonus should lead the list, and toe extension and toe flexion come last of all. We find, however, leg extension at the top of the list and ankle clonus at the bottom. One toe extension is near the top and also one toe flexion.

3. *Relative Weight of Part Moved.*—Inspection of our list with this thought in mind shows that the heaviest part moved is the most frequent reflex; therefore, there is no relationship here.

4. *Relation of the Subjective Sensitiveness to the Stimulation Area.*—Surely the patella tendon is less sensitive than the foot sole; and yet the order is reversed. The less sensitive is the most frequent.

To be sure, toe extension from plantar stimulation is more frequent than the same from the lower leg stimulation.

Therefore, the presence of sensitiveness seems to have some slight relation to frequency.

5. *Comparison of Skin and Tendon Reflexes.*—

Skin		*Tendon*	
Babinski	22	Knee jerk	26
Chadduck	17	Rossolimo	21
Trummer's Babinski	14	Marie	18
Gordon	14	Strümpell	18
Trummer's Oppenheim	13	Mendel-Bechterew	16
Oppenheim	12	Ankle clonus	11
Trummer's Gast	9	Trochmorten	9
		Patella clonus	8
	101		127

From this it follows that tendon reflexes exist in slightly greater frequency, in general, than do the skin reflexes.

6. *Comparison of Heights in the Cord.*—The relative position in the various cord segments where the above reflexes are located is as follows:

Knee jerk	L2–L4	These levels equal the segmental innervations of the muscles in action.
Babinski	L4–S1	
Rossolimo	L5–S1	
Strümpell	L4–S1	
Mendel-Bechterew	L4–S1	
Trummer's Babinski	L4–S1	
Gordon leg	L4–S1	
Trummer's Oppenheim	L4–S1	
Oppenheim	L4–S1	

Here we see the most frequent is highest; otherwise there is no pronounced relationship between frequency and low level in the cord.

Conclusion.—In our search then for etiology to account for the series of relative reflex frequency, or to find any variable background to influence the sequence of that series, we have found:

1. Tendon reflexes exist in slightly greater frequency.
2. Sensitiveness tends somewhat to increase frequency.

Therefore being a tendon or being sensitive tends to place a reflex high in the order of frequency.

For the opportunity to carry out this research my gratitude is due to Dr. Taylor, Dr. Thomas, Dr. Knapp, Dr. Mitchel and Dr. Frost.

The cremaster—though included in the list of reflexes taken—has been omitted in our consideration because its pathological exaggeration is difficult to determine independently of other reflexes.

As far as I know this is the first scientific investigation of relative reflex frequency. In research science proceeds as follows: (1) Collection of all related facts without bias. (2) Tabulation of these facts to show interrelations. (3) Inference logically drawn from these tabulations in the form of new truths.

This procedure I have followed with the reflexes—where no regular sequence, based on scientific investigation, has ever been followed in clinical examination.

I therefore present for consideration and adoption in our routine neurological examination the above logically and scientifically established list of reflexes that are now shown to be in the relation of relative frequency.

Final Conclusion.—

(1) That upon the basis of the above established reflex-frequency, the routine clinical series should be as follows:

Leg	*Arm*
1. Knee jerk.	1. Jacobsohn.
2. Babinski.	2. Weil.
3. Rossolimo.	3. Triceps.
4. Strümpell.	4. Wrist.
5. Mendel-Bechterew.	
6. Trummer's Babinski.	
7. Gordon of the leg.	
8. Trummer's Oppenheim.	
9. Oppenheim.	

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

STATED MEETING, HELD AT THE N. Y. ACADEMY OF MEDICINE,
JUNE 3, 1913

The President, DR. SMITH ELY JELLIFFE, in the Chair

BRAIN OF PATIENT WITH CORTICAL ASTEREOGNOSIS

By Dr. Smith Ely Jelliffe and Dr. Louis Casamajor

The patient from whom this specimen was obtained was a woman, 43 years old, a housewife, born in this country, a patient of Dr. Jelliffe's who was admitted to the Neurological Institute on June 3, 1912, suffering from paralysis of the right side of the body and inability to recognize objects in the right hand. Her father died at the age of 51 of asthma; her mother at the age of 59 of apoplexy. There was no history of neuroses or psychoses in the family. The patient had been married for 24 years, and was the mother of two children, one living and one dead. She also had two miscarriages.

The history obtained from the patient was that she had enjoyed good health until July, 1910, when she began to suffer from severe headaches, which were almost continuous. After improvement under treatment, the headaches returned in May, 1911, and were continuous and severe. About two months after this the right arm began to feel weak, and later the corresponding leg was similarly affected. At that time she consulted Dr. Jelliffe, and he made a diagnosis of brain tumor in the left supramarginal gyrus.

The weakness and stiffness in the arm and leg continued, and in November, 1911, both of these extremities became paralyzed so that the patient could not get out of bed and was unable to hold objects in her right hand. At this time an operation was advised, but refused, and the patient was given a course of mercury and iodide. Examination showed a spastic hemiplegia, with marked astereognosis in the right hand, and sensory aphasia with paraphasic speech. The fundi were normal. Following mercurial-iodide treatment, the patient improved somewhat: the headaches disappeared, the weakness was less pronounced and she was able to walk about the house and go on the street. Her skin had a distinctly bronze color, which came on rather rapidly about two years ago, but which she thought had not progressed much of late. Wassermann tests were persistently negative. Spinal fluid findings were negative. The urinary findings were negative for sugar and albumen.

On account of the bronzing of the skin, together with the X-ray findings, which showed a rather indefinite picture of an enlarged kidney on the right side, an exploration of the kidney region was made by Dr.

Alfred S. Taylor. The suprarenal body was found to be normal, while the kidney itself was the seat of a chronic nephritis.

The patient returned to the hospital on August 9, 1912, with the statement that she had been entirely well until the previous day, when she was taken with a severe headache, with involuntary twitchings and spasms of the right side of the body, but most pronounced in the right leg. At this time she also developed an internal strabismus. An examination of the eyes, made on August 29, showed that the pupils were small and reacted normally. The ocular movements were slow, but complete. There was no nystagmus; no facial paralysis; sensation was normal. The right upper extremity was more spastic than at the time of her former stay at the hospital. The astereognosis in the right hand was unchanged.

During the summer of 1912 the patient grew progressively weaker; she seemed confused and at times almost comatose. The ocular movements varied from day to day; sometimes there was double internal strabismus; at other times only weakness of the external rectus. Death occurred in November, 1912.

The patient's brain, Dr. Casamajor said, had not yet been examined, and the report thus far was to be regarded as only preliminary. The pathological findings would doubtless prove of interest on account of the presence of definite astereognosis, and the results would be reported at some future date. All that could be seen in the brain at this time was a depressed area of softening just above the supra-marginal gyrus on the left side and a general atrophy of the convolutions of the left hemisphere.

CORTICAL ASTEREOGNOSIS FROM A CYST: OPERATION, WITH IMPROVEMENT

By Dr. J. Arthur Booth

Dr. Booth presented a young man of 22, who was a perfectly healthy and intelligent lad until July 12, 1906, when he met with the following accident: He was on a pile driver and attempted to descend to the dock by sliding down a rope. When about 35 feet from the ground one of his companions jerked the rope and he fell, striking on his head and right arm. He was taken to the Perth Amboy Hospital, where an examination revealed a compound, comminuted fracture of the right parieto-occipital region and of the right forearm. He was unconscious for five days, but finally made a good recovery, and after a period of seventeen days was discharged as cured.

After his return home it was noticed that he was dull and stupid and quite changed from his former self. A year later he had what was called one or two "sinking spells," without any spasmodic movements of the muscles. He had one attack in 1908, another in 1909, a third in 1910, a fourth in 1911 and two in October, 1912. In March, 1913, he had three attacks, and during the following month he had two which he described as follows: "I feel a tingling and numbness in the right hand; it is then drawn up and I feel my head turning to the right: then I lose myself." His mother stated that he then became stiff all over and that on one occasion he had bitten his tongue. Besides these epileptoid attacks he frequently had severe headaches, limited to the left fronto-parietal region, the pain being so severe at times that he had been noticed to pound his head with his fist.

Examination by Dr. Booth, April 15, 1913: From a bright intelligent school-boy, standing at the head of his class, he was now apathetic and dull; all mental processes were slow in reaction with a very faulty memory both for recent and past events. He answered questions slowly and hesitatingly, but there were no motor speech defects. The superficial and deep reflexes were present and normal, excepting the knee jerks, which were exaggerated. No ankle clonus nor Babinski. The tongue was protruded in a straight line and there was no paralysis of the facial muscles. The equilibrium was fairly good. There was no marked ataxia. He was right-handed, and the right upper extremity was weaker than the left, though it must be remembered that the right forearm was broken at the time of the accident. There was a decided loss of sensation over the right upper extremity, and to a lesser degree on the right side of the face, as compared with the left. The same applied to the right thigh, as compared with the left. The patient was unable to write anything but his name, which he did slowly and with difficulty. He could, however, write from copy. There was no transposition nor misuse of words. He was able to count up to 100, and recognized figures when they were placed before him. He could recognize but two letters of the alphabet, namely A and P, and could not read the simplest word or sentence. When blindfolded, he failed to recognize a bottle, knife, watch, coins of different denomination, chain, key or pipe with the right hand, but readily did so with the left. The pupils were widely dilated, but reacted slowly to light and accommodation. The fundi were normal.

Taking into consideration the above findings, a diagnosis was made of a cyst in the left angular gyrus, the result of a former hemorrhage, and an operation for its removal advised.

Operation, April 26, 1913, by Dr. George E. Brewer: Upon elevating the usual parieto-temporal osteoplastic flap, the dura was found tense and bulging just beneath the parietal eminence. It was incised, and in so doing a cyst was opened in the upper and posterior part of the exposed area. The cyst was about the size of a silver half dollar, situated over the left angular gyrus, extending forward and bound down with adhesions. These were freed and a drain placed in the cyst cavity after it was completely emptied of about two drams of clear fluid.

The patient made a good recovery from the ether, but during the next three days he had a number of convulsive seizures which began in the left hand and gradually became general. Dr. Booth then suggested that the drain be removed, and when this was done the convulsions ceased and he had remained free from them since. He continued to improve, and on May 12, three weeks after the operation, he read from a book that was handed him "Night Orderly Report," and from a newspaper "Giants Win." He left the hospital on May 18. When Dr. Booth saw him again, on June 3, he had gained ten pounds in weight. Mentally, he was much brighter and there was a marked improvement in his memory. He had had no further convulsive attacks and no headache. There was still slight weakness of the right hand, with marked astereognosis. He could recognize a majority of the letters of the alphabet, could read a few simple words and two short sentences.

Dr. William M. Leszynsky said that in connection with these two cases with astereognosis he wished to report briefly a case that was recently under his observation. The patient was a boy, six years old, an unusually intelligent child, who entered the hospital with the history of having been well up to three months previously. There was a rather indefinite story of a fall, but no evidence of any injury to the head. On admittance he seemed to be slightly apathetic. He complained of dizziness and had occasional attacks of headache and vomiting. Examination revealed complete astereognosis in the left hand, and, in addition, a typical Babinski plantar response in the same side. There were practically no other symptoms. No rigidity; nothing in the eye grounds. Within a week, rigidity began to develop in the left lower extremity, followed by partial paralysis. Subsequently, these symptoms extended to the left upper extremity, and about a week later the first eye symptoms appeared in the shape of a slight papilloedema. A subcortical lesion originating in the upper gyrus of the parietal lobe was diagnosticated, and an operation advised. Before it could be undertaken, however, the boy became comatose and died. An autopsy was refused. In this case, Dr. Leszynsky said, the lesion apparently developed in the parietal lobe and extended to the leg and arm centers.

Dr. I. Abrahamson said that in the case reported by Drs. Jeliffe and Casamajor, the condition simulated a tumor. The speaker said he had seen four cases during the past year where choked disk and the other symptoms that were present were strongly indicative of a tumor of the brain, but eventually they all proved to be cases of nephritis, and no tumor was found. A number of similar cases had been reported, and the possibility of a chronic nephritis, with vague symptoms of intracranial pressure, which simulated brain tumor and might tempt one to operate, should always be borne in mind. In all of his cases, Dr. Abrahamson said, the blood pressure had been high.

Dr. Leszynsky said that Dr. Strauss might recall a case in the speaker's service at the Lebanon Hospital where the patient had many symptoms of a brain tumor. Upon exploratory operation an area of thrombotic softening was found in the cortex secondary to endarteritis associated with chronic nephritis.

Dr. I. Strauss said he had done the autopsy in two of the cases referred to. One of the patients had practically no focal symptoms, but in all of them there was marked choked disk, which was very puzzling. In both of them there was a chronic nephritis, with albumin and casts, high blood pressure and marked choked disk. The latter symptoms advanced very rapidly, and a decompression was done in the hope, principally, of saving the sight. After death, an examination of the brain revealed nothing but a very extensive arterio-sclerosis, limited chiefly to the smaller vessels all over the cortex.

The President, Dr. Jeliffe, speaking of the patient with cortical astereognosis reported by Dr. Casamajor and himself, said that for a long time they were in doubt whether or not they had to deal with a brain tumor, but in view of the very gradual extension of the process it was decided that if there was a new growth in the brain, it was of such a nature that its removal would be practically impossible—that if it was a new growth, it was probably of an infiltrating nature. The result showed that it was an infiltrating process in the nature of a diffuse atrophy, with specially intense development in one area. The true nature of the atrophic process has not yet been determined.

A CASE OF MYOTONIA ATROPHICA

By Dr. Foster Kennedy

Dr. Kennedy said the rarity of this curious muscular degeneration was his excuse for the report of a single case. Myotonia congenita—the so-called Thomsen's disease—was not very uncommon, but the combination of increased tonus in some muscles with a primary flaccid palsy in others in remarkably constant distribution was so rare that but four cases had been as yet reported in the medical literature of this country. The disease was apparently peculiar to persons in middle life; it was of a very slowly progressive character, and in rather more than half the cases was of the familiar type. The symptom-complex was so constant and so characteristic that when once understood, recognition of subsequent cases became simple.

In Dr. Kennedy's case the patient was a male, single, 46 years old, a native of Switzerland, who was admitted on March 17, 1913, to the Cornell Medical Division of Bellevue Hospital, under the care of Dr. W. Gilman Thompson, who kindly asked Dr. Kennedy to see the case and by whose courtesy he was permitted to make use of these notes. The patient's parents had both died in old age. He had three brothers and three sisters in good health. One sister, a resident in the United States, had arthritis deformans. There was no neuropathic family history: neither the patient nor his sister knew of any near or collateral relative affected in any way similarly to the case under consideration. For fourteen years the patient had been employed as a farmer in New England. His habits were regular and his general health good. His consumption of alcohol was limited to two or three glasses of beer a day, and he denied venereal disease.

His previous health had always been good. In 1893 his left cornea was injured by a burning spark falling on it from a passing engine. In 1887 his hands and feet were said to have been frost-bitten. In November, 1911, after hard work in harvest time, he began to suffer from cramplike pain in the lumbar region. These pains were at first intermittent and rare, but later became more frequent, so that at the time of examination he complained constantly of their presence. He could recall no injury to account for this condition, which was more severe when he worked in a bent posture. He strenuously denied having any difficulties in his gait or in the use of his hands, and gave no history of sphincteric trouble. He had not worked for a year, but was never confined to bed.

His facial appearance was quite strikingly characteristic, and was the result of an incomplete ptosis of both eyelids, with marked hollowing of the temporal fossæ and flattening of the masseteric region on each side. The orbicular muscles of the eyes were very weak, and there was no movement in the temporal or masseter muscles. The left pupil was hidden by a corneal scar, the result of the injury just related. The reaction of the right pupil was normal. A well-marked and advanced cataract was present on each side; that on the left side might have been thought traumatic in origin had not that in the right lens been so obviously otherwise. A slight, bilateral divergent strabismus was evidently a result of defective vision. The patient's articulation of both English and French was slurred and difficult to follow: no structural defect was found which could account for this symptom. The sternomastoid muscles were completely atrophic, and there was some wasting in the extensor muscles of the forearms. The position of rest of both hands was one of slight flexion, the thumbs being strongly adducted. All movements were present, but it was found that after making a strong grasping movement with either hand, he was unable quickly to again extend the fingers, the involved muscles, apparently, being in a state of cramp. If the grasping movement were frequently and quickly repeated, this cramp became less and less noticeable, until after perhaps a dozen efforts it would completely disappear. This phenomenon was not present in any other muscles or group of muscles.

The abdominal muscles and those of the back and chest were normal, as was also the spine. The vastus internus and externus of the right thigh were diminished in bulk, though no change was found in the intervening rectus femoris muscle. The knee jerk on the right side was difficult to obtain—a reduction in response directly proportional to the reduction of the muscular mechanism involved. There was almost complete atrophy of the anterior tibial and peroneal muscles, with complete bilateral foot drop as a result. The ankle jerks and plantar reflexes were absent. The abdominal and arm reflexes were normal. The gait was of the steppage character peculiar to paralysis of the dorsi-flexors of the feet. There were no sensory changes. No reaction to faradism or galvanism in the orbicular eye muscles, the temporals, masseters or sternomastoids, and almost complete loss in the anterior tibial groups of both sides. In the muscles of the forearms and in the intrinsic hand muscles the reactions were strong, but enormously prolonged. There were no pathological changes in either the blood or urine. The Wassermann test in the blood serum and the cerebrospinal fluid was negative.

The combination of premature bilateral cataract with atrophy of the temporal and orbicular eye muscles, and of the masseters, sternomastoids, vasti and anterior tibial muscles, together with a sharply contrasted myotonus in the hands occurred too infrequently to be ignored, and most probably pointed to a deficient hereditary endowment as the approximate cause of the disease.

Dr. J. Ramsay Hunt said the case reported by Dr. Kennedy corresponded very closely to one which the speaker showed at a meeting of the society some years ago. In that case there was the Charcot-Marie type of atrophy of the extremities, with involvement of the facial muscles. The phenomena of myotonia were quite active in the tongue and the masseter muscles, and this was also observed in a later case that he had seen. The myotonic electrical reactions were also well marked.

Dr. I. Abrahamson referred to a typical case of myotonia atrophica that had come under his observation. The patient was a woman whose brother had been shown at a meeting of this society by Dr. Stieglitz about ten years ago as an example of the peroneal form of dystrophy. In his own case, the speaker said, the patient also had bilateral cataract and there was a congenital absence of certain muscles, such as the sternal portion of the pectorales. In another case, now under observation at the hospital, the symptoms were strongly suggestive of myotonia atrophica. The patient was a man who presented a fibrillary twitching of the tongue, etc., with weakness of one sternomastoid; yet, owing to the fibrillary twitching, etc., it was most likely not a case of myotonia.

Dr. Kennedy, in closing, said a peculiar feature of myotonia atrophica was the extraordinary uniformity in the appearance of these patients. They all looked as though they belonged to the same family—like brothers and sisters. There was more uniformity in their symptoms than in other forms of dystrophy.

The electrical reactions showed a quantitative change in the atrophied muscles, but in the forearm there was an increase in the reaction to both galvanism and faradism, and the reactions were very long drawn out. The muscles easily went into a tetanoid condition, which was at complete variance with the action of the atrophied muscles.

CAUDA EQUINA NEURITIS

By Dr. F. Kennedy

Dr. Kennedy presented an Italian, 49 years old, who was admitted to the Neurological Institute on May 8, 1913, with the history that five years ago he developed a severe pain in the middle of the back, subsequently extending to the left leg and later to the right. It was shooting in character, and after persisting for several months it was said to have disappeared after the injection of morphine. Later, he noticed a "dead" feeling in both legs: this progressed, and walking became more and more difficult until he was bedridden. There was no history of incontinence, but he stated that since the onset of his illness he had to strain before passing urine. He was bedridden for two years, when he began to regain power in the legs, and the improvement slowly continued until he was able to walk. He now walked fairly well, but was handicapped by double drop-foot. The upper extremities had never been involved. There was now no pain, but occasional pin-and-needle sensations in the feet.

Examination showed marked atrophy of the tibialis anticus and peronei muscles, and the symptom complex was referable to a lesion of the cauda equina which at one time we might have attributed to the presence of a tumor in that region, but in the cases which the author had reported at the recent meeting of the American Neurological Association in Washington they had found no tumor, but a congested appearance of the nerve roots. In the case shown to-night, the patient, after being bedridden for two years, had gradually improved, which we would not expect to find with tumor, and we were therefore justified in believing that these cases were due to a lesion which was not luetic, nor to the presence of a new growth, but rather to an infective, inflammatory state of the cauda equina, possibly a neuritis..

Dr. Leszynsky said that in certain cases of this type, in which the patients presented symptoms of tumor of the cauda equina, puncture of the spinal canal had failed to give any fluid, and this might serve as a differential point between neuritis and neoplasm.

Dr. William B. Noyes asked Dr. Kennedy whether muscular atrophy in this case was a prominent symptom. How far was muscular atrophy to be expected in neuritis and lesions of the conus medullaris. The speaker had been puzzled by this symptom in various cases. He recalled one case presenting the general symptoms of a double sciatica, excepting that the knee jerks were increased rather than diminished. This patient had a tubercular involvement of the left ankle joint, and there was a prominence of one of the lower lumbar vertebræ which the surgical advisors considered an evidence of incipient Pott's disease, but this idea was disproved by the fact that two years later the condition remained unchanged, and there was evidence that it had always existed. In this case there was double sciatica, plus a slight involvement of the lower cord, and the question naturally arose whether the exaggeration of the reflexes was not caused by the extension of the process beyond the cauda.

In another case, Dr. Noyes said, in an adult, a diagnosis of a tumor of the cord or chronic anterior poliomyelitis seemed obvious on account of the atrophy, added to other symptoms of the nature of those in the case of Dr. Kennedy. In that case, marked improvement took place in two months after thorough electrical treatment, and an ascending neuritis with the most marked symptoms in the cauda or conus medullaris was probably the correct diagnosis.

Dr. J. Ramsay Hunt said that while primary neuritis of the cauda equina was admitted by some authorities, and had been described by Raymond, yet the case presented by Dr. Kennedy showed such an extreme degree of degeneration for a neuritis that he thought the diagnosis was open to question. The condition which is now old and apparently stationary resembled what we saw after syphilis of the cauda, and following myelitic affection in the region of the conus. A neuritis, accompanied by such a degree of degeneration and strictly localized to the cauda, was rather difficult to conform with our ideas of the pathology of neuritis in general, especially degenerative neuritis which involves the distal portion of the neural tree. Such severe degeneration is not observed in the brachial and sciatic types of neuritis which is rather a perineuritis, and here we had a man who was bed-ridden for a long time and who even now, after all these years, showed evidence of foot-drop, with areas of anesthesia, and the gravity of whose symptoms was apparently disproportionate to the cause to which Dr. Kennedy attributed them. The possibility of an old syphilis should not be lost sight of, in spite of the negative Wassermann, as well as myelitis of the sacral cord from some other cause.

Dr. I. Strauss said he wished to take exception to the remark made by Dr. Hunt that the Wassermann test had its uncertainties. That might hold good in some instances, but given a case where the spinal fluid showed no change by the Wassermann reaction, no increase of cells nor globulin, it was fairly good evidence that we were not dealing with a specific lesion.

Dr. Strauss said that in a case seen at the Montefiore Home about two years ago the patient presented marked symptoms of a lesion of the cauda equina and the conus as well. This patient had been treated with mercury in various forms and very vigorously, but without benefit, and despairing of ever getting well, he committed suicide. At autopsy, his cord showed a remarkable condition, because not only were the meninges the seat of an active syphilitic process, but the cord itself was the seat of a very active syphilitic myelitis. In that case, no doubt, an early lumbar puncture would have shown the evidence of a syphilitic process, while later on no fluid would probably have been obtained.

Dr. Abrahamson said that in one case of specific involvement of the cauda equina which refused to yield to salvarsan and mercury, the patient showed symptoms similar to those in the case presented by Dr. Kennedy, excepting that the clinical picture of a caudal lesion was more complete. In that case the Wassermann was positive.

Dr. Alfred S. Taylor said that Dr. Hunt was possibly influenced in his view that this case might be syphilitic by the patient's nasal deformity, which the patient stated, however, was the result of an injury. This statement was borne out by the appearance of the deformity, which was a traumatic saddle-nose. The nasal bones here had not lost their contour, while in true saddle-nose the bones were necrosed and the saddle was much higher up.

Dr. Kennedy, replying to Dr. Noyes, said that in his other cases of this condition, the atrophy was very distinct and complete, and occurred in the affected root areas, corresponding with the sensory areas.

Dr. Kennedy thought the position taken by Dr. Hunt was an interesting one, but not entirely logical. The speaker said he had made no claim that a lesion of the cauda equina could not be produced by syphilis: in fact, the cases mentioned by Dr. Abrahamson and Dr. Strauss, as well as those reported by Oppenheim and in French and English literature showed definitely that we may have lesions of the cauda equina produced by syphilitic pachymeningitis, but those facts did not disprove that in the case he had shown to-night as well as in the cases he had reported previously we had to deal with a non-luetic lesion of the cauda equina. If we placed any reliance at all on the Wassermann test—although we knew that in a certain number of cases the reports led to a false conclusion—we had to give some weight to it in the six cases he had reported. All of these patients gave a negative syphilitic history; they claimed they had never been infected, and we had no grounds for disbelieving them. They had not been given anti-syphilitic treatment, but both the Wassermann test and the test of the cerebrospinal fluid were negative, and it seemed that under those conditions we were justified in assuming that the individual was not syphilitic. Possibly, in these cases, we had a degenerative process of the cauda equina due to some toxin the nature of which we were ignorant, and which gave rise to symptoms similar to those caused by the syphilitic virus.

A CASE OF MULTIPLE SCLEROSIS TREATED FOR INCONTINENCE

By Dr. I. Strauss

The patient was a man, 47 years old, who was admitted to the Mount Sinai Hospital on December 5, 1912. His family history was unimportant. The patient was moderately alcoholic and gave a history of gonorrhea and syphilis twenty years ago.

Two years ago it was noticed that the patient had difficulty in remembering things, with slowness of speech and motor aphasia. Eight months ago he complained of weakness in the legs when walking, and two months later he developed vesical incontinence, with occasional rectal incontinence. There was also diplopia and loss of weight. An examination at the time of his admission to the hospital showed, in addition to the above symptoms, nystagmus and tremor of the head, exaggerated knee jerks, slight Romberg, slow speech and diminished abdominal reflexes. A cystoscopic examination showed a trabeculated bladder, with a mild cystitis. The Wassermann test at this time was negative. Under repeated injections of salvarsan and epidural injections of sterile alboline, the patient gradually regained control of his bladder function, and when he left the hospital, on May 1, 1913, he was urinating about five times in the course of 24 hours, and was able to retain his urine from six o'clock p. m. to six a. m. without discomfort.

Dr. Abrahamson said that Dr. Edwin Beer had advised the introduction of alboline into the bladder for incontinence. By this method, however, the effect was more transient and not to be compared to the results of the epidural method.

HYSTERO-EPILEPSY (PIBLOKTO) AMONG THE ESKIMOS

By Dr. A. A. Brill

While reading Peary's fascinating book "The North Pole," he was especially interested in what Peary called a peculiar form of nervous affection found among the Eskimos of the western coast of Greenland from Cape York to Etah which they called piblokto and which he designated as a form of hysteria. Peary stated that he had never known a child to have piblokto, but that some of the adult Eskimos would have an attack every day or two, and that one day they had five cases.

Concerning the attack proper, Peary spoke as follows: "The patient, usually a woman, begins to scream and tear off and destroy her clothing. If on a ship, she will walk up and down the deck, screaming and gesticulating, and generally in a state of nudity, though the thermometer may be in the minus forties. As the intensity of the attack increases, she will sometimes leap over the rail upon the ice, running perhaps half a mile. The attack may last a few minutes, an hour or even more, and some sufferers become so wild that they would continue running about on the ice perfectly naked until they froze to death if they were not forcibly brought back." Peary goes on to say that when the attack takes place indoors, nobody pays much attention to it unless the sufferer should reach for a knife or attempt to injure someone. The attack usually ends in a fit of weeping, and when the patient quiets down, the eyes are bloodshot, the pulse high, and the whole body trembles for an hour or so afterwards. It was also remarkable that the Eskimo dog suffered from a morbid condition by the same name. Peary stated that it did not seem to be infectious, though its manifestations were similar to those of hydrophobia.

For diagnostic purposes, Dr. Brill said he tried to ascertain whether these attacks of piblokto were accompanied by a loss of consciousness. Prof. Donald B. MacMillan, an anthropologist, and one of Peary's trusted lieutenants during the successful quest of the North Pole in 1908–1909, was certain that all of the cases he saw showed a loss of consciousness and that they were all in a confused state. Thus, they were perfectly harmless when left to themselves, but showed a blind resistance if prevented from following out their various vagaries.

Granting this loss of consciousness to be so, it would not simplify matters as regarded diagnosis. Loss of consciousness might be a concomitant symptom of hysteria or epilepsy. So far as could be ascertained, none of those afflicted ever showed a typical *grand mal* attack. On the other hand, everything pointed to hysteria. The disease was almost exclusively confined to the female sex: Professor MacMillan quoted Peary as saying that in 20 years he saw only one man who had what he thought was piblokto, and the disease was practically unknown in children. Of the 20 women aboard the *Roosevelt*, eight had piblokto. The Eskimos themselves thought that the disease had something to do with the evil spirit, and for that reason they were reluctant to touch the afflicted during the attack.

The only probable cause of this affliction mentioned by Peary was of a psychogenetic nature. He said, "The immediate cause of this affection is hard to trace, though sometimes it seems to be the result of a brooding over absent or dead relaives, or a fear of the future." In other words, in the ultimate analysis, it was love and hunger. Professor MacMillan believed the attacks were caused by abuse. Most of the Eskimo women who had this disease were of a jealous disposition: they either imagined themselves ill-treated, or they actually suffered abuse at the hands of their husbands, who beat them with their fists. Many Eskimos were cruel to their wives. Speaking of the attacks he said they reminded him of a little child discouraged and unhappy because it imagined that no one loved it nor cared for it, and therefore ran away. This plainly showed, Dr. Brill said, that as in civilized people, it was hunger and love—especially the latter—that played the great part in the causation of hysteria. It was also interesting to note that it was not the lack of the gross sexual, but the ungratified desire for love that was the determining factor. [Complete paper published in August number of Journal of Nervous and Mental Disease.]

Dr. M. J. Karpas said the description of these cases given by Dr. Brill was too indefinite to permit one to form an opinion as to the true nature of the mental upset observed among the Eskimos. The attack, *per se*, presented no definite landmarks of diagnostic validity. It might have been of a manic, katatonic, hysterical or epileptic reaction; also such episodes one might observe in constitutional inferiors. Since we knew nothing of the make-up and psychic abnormalities of Eskimos in general, the speaker said he would be reluctant to offer a definite terminology for this mental upset. It appeared to him that it would be more conservative to look upon these episodes as peculiar psychic manifestations whose nature could not be understood.

Dr. Brill, in closing, said that these attacks resembled the "running amock" of the Malays, but that it was difficult to say whether there was really a total loss of consciousness or not. He saw no objection to calling such an attack a peculiar psychical manifestation, but he saw no reason why Dr. Karpas should think that these attacks showed any resemblance to a manic depressive psychosis or to catatonia. There was absolutely nothing in these attacks to suggest these diseases.

SOME NOTES ON "TRANSFERENCE" IN PSYCHOANALYSIS

By Dr. Smith Ely Jelliffe

He said that the whole psychoanalytic situation, so far as successful therapy was concerned, was intimately bound up in the subject of transference, and one whose purpose it was to attempt to get at the causes for good or bad therapy, must needs view this situation as comprehensively as possible.

Stated categorically and baldly, it might be said that without proper transference, a successful therapy for the psycho-neuroses was impossible. In speaking of rapport or transference, it was well known that we were not dealing with any new phenomenon: it was older than the Mosaic law, and, like other old truths, it was constantly being stated and restated from epoch to epoch, in new forms and at recurring times with sharper and sharper differentiation.

The psychoanalytic method fortunately enabled one to deal with the subject of transference much more definitely than ever before. It afforded positive criteria whereby one was enabled to watch its development, realize its tendencies, guide its directions; and, at times, regain its losses for the sake of the patient. At the same time it provided the most exquisite sensitizer which, rightly used, compelled the psychoanalyst to search his own resistances, and forced him to keep clearly the goal in view, *i. e.*, the patient's best interest, and not his own gratification or glorification.

If psychoanalysis, as a method, really permits any great advance over earlier methods of handling the psycho-neuroses, it must in some measure be through its better knowledge of and modes of dealing with transference.

Dr. Jelliffe gave a number of illustrative dream fragments showing the mechanisms of transference. These showed forms of transference which were readily interpretable and which had been described particularly by Freud, Stekel and other workers in psychoanalysis.

Dr. A. A. Brill said he appreciated the truth of Dr. Jelliffe's remarks, but he could readily understand how they could fail to impress one who had done no actual work in the field of psychoanalysis. He believed that every physician, consciously or unconsciously, came in contact with these cases of "transference," which played an important part in the success of his practice. We know that certain drugs are effective in the hands of one man while they are inert in the hands of another, and that the impression made on the patient often depended more on the personality of the physician than on the drug he prescribed. This was only another phase of "transference." Hysterical accusations not infrequently made against physicians by patients were often due to an over transference and subsequent transformation into hate; a general knowledge of this subject might prove of great value to every physician.

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

of Vienna.

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(Continued from p. 539)

When they saw the star, they rejoiced with exceeding great joy. And when they were come into the house, they saw the young child with Mary his mother, and fell down and worshipped him: and when they had opened their treasures, they presented unto him gifts; gold, and frankincense, and myrrh. And being warned of God in a dream, that they should not return to Herod, they departed into their own country another way. And when they were departed, behold, *the angel of the Lord appeareth to Joseph in a dream, saying, Arise, and take the young child and his mother and flee into Egypt,* and be thou there until I bring thee word: for Herod will seek the young child to destroy him. When he arose, he took the young child and his mother by night, and departed into Egypt; and was there until the death of Herod; that it might be fulfilled which was spoken of the Lord by the prophet, saying, Out of Egypt have I called my son. Then Herod, when he saw that he was mocked of the wise men, was exceeding wroth, and sent forth, and *slew all the children that were in Bethlehem, and in all the coasts thereof, from two years old and under,* according to the time which he had diligently enquired of the wise men. Then was fulfilled that which was spoken by Jeremiah the prophet, saying, In Rama was there a voice heard, lamentation, and weeping, and great mourning, Rachel weeping for her children, and would not be comforted, because they are not.

But when Herod was dead, behold, an angel of the Lord appeareth in a dream to Joseph in Egypt, saying arise and take the young child and his mother, and go into the land of Israel: *for they are dead which sought the young child's life.* And he arose and took the young child and his mother, and came into the land of Israel. But when he heard that Archelaus did reign in Judea in the room of his father Herod, he was afraid to go thither: notwithstanding being warned of God in a dream, he turned aside into the parts of Galilee. And he came and dwelt in a city called Nazareth; that it might be fulfilled which was spoken by the prophets, He shall be called a Nazarene."[52]

Similar birth legends to those of Jesus have also been transmitted of other "founders of religions"; such as Zoroaster, who is said to have lived about the year 1000 before Christ. His mother Dughda dreams, *in the sixth month of her pregnancy,* that the wicked and the good spirits are fighting for the embryonic Zoroaster; a monster tears the future Zoroaster from the mother's womb, but a light god fights the monster with his horn of light, re-encloses the embryo in the mother's womb, blows upon Dughda, and she became pregnant. On awakening, she hurries in her fear to a wise dream interpreter, who is unable to explain the wonderful dream before the end of three days: The child, which she is carrying, is destined to become a man of great importance; the dark cloud and the mountain of light signify, that she and her son will at first have to undergo numerous trials, through tyrants and other enemies, but at last they will overcome all perils. Dughda at once returns to her home, and informs Pourushacpa, her husband, of everything that has happened. Immediately after his birth, the boy was seen to laugh: this was the first miracle through which he drew attention to himself. *The magicians announce the birth of the child as a portent of disaster to the prince of the realm,* Durânsarûn, who betakes himself without delay to the dwelling of Pourushacpa, in order to stab the child. But his hand falls paralyzed, and he must leave with his errand undone, This was the second miracle. Soon after, the wicked demons steal the child from his mother and carry him into the desert, in order to kill him; but Dughda finds the unharmed child, calmly sleeping. This is the third miracle. Later on, Zoroaster was to be trampled upon, in a narrow passage way, by a herd of oxen, by command of the king.[53] But the largest of the cattle took the child between his feet, and preserved it from harm. This was the fourth miracle. The fifth is merely a repetition of the preceding. What the cattle had refused to do, was to be accomplished by the horses. But again the child was protected by a horse from the hoofs of the other horses. Durânsurûn thereupon had the cubs in a wolf's den killed during the absence of the old wolves, and Zoroaster was laid down in their place. But a god closed the jaws of the furious wolves, so that they could not harm the child. Two divine cows arrived instead and presented their udders to the child, giving it to drink. This was the sixth miracle, through which Zoroaster's life was preserved. (Compare Spiegel's Eranische Altertumskunde, I, pp. 688 et seq., also Brodbeck, Zoroaster, Leipzig, 1893.)

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[52] According to recent investigations, the birth history of Christ is said to have the greatest resemblance with the royal Egyptian myth, over five thousand years old, which relates the birth of Amenophis III. Here again recurs the divine prophecy of the birth of a son, to the waiting queen; her fertilization by the breath of heavenly fire; the divine cows, which nurse the new born child; the homage of the kings, and so forth. In this connection, compare A. Malvert, Wissenschaft und Religion, Frankfort, 1904, pp. 49 et seq, also the suggestion of Professor Idleib in Bonn (Feuilleton of Frankfürter Zeitung, November 8, 1908).

Related traits are also encountered in the history of Buddha, whose life is referred to the sixth century before Christ; such as the long sterility of the parents, the dream, the birth of the boy under the open sky, the death of the mother and her substitution by a foster-mother, the announcing of the birth to the king of the realm; later on the losing of the boy in the temple (as in the history of Jesus; compare Luke 2, 40–52).

SIEGFRIED

The old Norse *Thidreksaga,* as registered about the year 1250 by an Icelander, according to oral traditions and ancient songs, relates the history of the birth and youth of Siegfried, as follows:[54] King Sigmund of Tarlungaland, on his return from an expedition, banishes his wife Sisibe, the daughter of King Nidung of Hispania, who is *accused* by Count Hartsin, whose advances she has spurned, of having had *illicit relations with a menial.* The king's counsellors advise him to mutilate instead of kill the innocent queen, and Hartsin is ordered to cut out her tongue in the forest, so as to bring it to the king as a pledge. His companion, Count Hermann, opposes the execution of the cruel command, and proposes to present the tongue of a dog to the king. While the two men are engaged in a violent quarrel, *Sisibe gives birth to a remarkably beautiful boy; she then took a glass vessel, and after having wrapped the boy in linens, she placed him in the glass vessel, which she* carefully closed again and placed beside her (Rassmann). Count Hartsin was conquered in the fight, and in falling kicked the glass vessel, *so that it fell into the river.* When the queen saw this she swooned, and died soon afterwards. Hermann went home, told the king everything, and was banished from the country. *The glass vessel meantime drifted down stream to the sea,* and it was not long before the tide turned. *Then the vessel floated on to a rocky cliff,* and the water ran off so that the place where the vessel was was perfectly dry. The boy inside had grown somewhat, and when the vessel struck the rock, it broke, and the child began to cry. [Rassmann] The boy's wailing was heard *by a doe,* which seized him with her lips, and carried him to her litter, *where she nursed him together with her young.* After the child had lived twelve months in the den of the doe, he had grown to the height and strength of other boys four years of age. One day he ran into the forest, where dwelt the wise and skilfull *smith, Mimi, who had lived for nine years in childless wedlock.* He saw the boy, who was followed by the faithful doe, took him to his home, *and resolved to bring him up as his own son.* He gave him the name of Siegfried. In Mimi's home, Siegfried soon attained an enormous stature and strength, but his wilfulness caused Mimi *to get rid of him.* He sent the youth into the forest, where it had been arranged that the dragon Regin, Mimi's brother, was to kill him. But Siegfried conquers the dragon, and kills Mimi. He then proceeds to Bruynhild, who names his parents to him.

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[53] Very similar traits are found in the Keltic saga of Habis, as transmitted by Justin (44, 4). Born as the illegitimate son of a king's daughter, Habis is persecuted in all sorts of ways by his royal grandfather, Gargoris, but is always saved by divine providence, until he is finally recognized by his grandfather, and assumes royal sway. As in the Zarathustra legend, there occurs an entire series of the most varied methods of persecution. He is at first exposed, but nursed by wild animals; then he was to be trampled upon by a herd in a narrow path; then he was cast before hungry beasts, but they again nursed him, and finally he is thrown into the sea, but is gently lapped ashore and nursed by a doe, near which he grows up.

[54] Compare August Rassmann: Die deutsche Heldensage und ihre Heimat, Hanover, 1857–8, Vol. II, pp. 7 et seq; for the sources, see Die deutsche Heldensage (collection Göschen) and Piper's introduction to the volume: Die Nibelungen, in Kürschner's German National Literature.

Similarly to the early history of Siegfried, an Austrasiatic saga tells of the birth and youth of *Wolfdietrich.*[55] His mother is likewise accused of *unfaithfulness,* and intercourse with the devil, by a vassel whom she has repulsed, and who speaks evil of her to the returning king, Hugdietrich of Constantinople.[56]

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[55] Compare: Deutsches Heldenbuch, Part III, Vol. I (Berlin, 1871), edited by Ainelung and Faenicke, which also contains the second version (B) of the Wolfdietrich saga.

The king surrenders the child to the faithful Berchtung, who is to kill it, but exposes it instead, in the forest, near the water, in the hope that it will fall in of its own accord and thus find its death. But the frolicking child remains unhurt, and even *the wild animals,* lions, bears, wolves, which come at night to the water, *do not harm it.* The astonished Berchtung resolves to save the boy, and he *surrenders him to a game keeper* who, together with his wife, raises him and names him Wolfdietrich.[57]

The following later hero epics may still be quoted in this connection. In the thirteenth century, the saga of *Horn,* the son of Aluf, who after having been exposed on the sea, finally reaches the court of King Hunlaf, and after numerous adventures wins the king's daughter, Rimhilt, for his wife. Furthermore, a detail suggestive of Siegfried, from the saga of the skilfull smith *Wieland,* who, after avenging his foully murdered father, floats down the river Weser, artfully enclosed in the trunk of a tree, and loaded with the tools and treasures of his teachers. Finally the *Arthur* legend contains the commingling of divine and human paternity, the exposure and his early life with a lowly man.

LOHENGRIN

The widely distributed group of sagas which have been woven around the mythic knight with the swan (the old French Chevalier au cigne) can be traced back to very ancient Keltic traditions. The following is the version which has been made familiar by Wagner's dramatisation of this theme. The story of Lohengrin, the knight with the swan, as transmitted by the medieval German epic [modernized by Junghaus, Reclam] and briefly rendered by the Grimm brothers, in their "German Sagas" (Part II, Berlin, 1818, p. 306) under the title: Lohengrin in Brabant.

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[56] The motive of calumniation of the wife by a rejected suitor, in combination with the exposure and nursing by an animal (doe), forms the nucleus of the story of *Genevefa* and her son Schnerzenreich, as told, for example, by the Grimm brothers, in their German Sagas, II, Berlin, 1818, pp. 280 et seq. Here, again, the faithless calumniator proposes *to drown the countess with her child in the water.* For literary and historical orientation, compare *L. Zaeher,* Die Historie von der Pfalzgräfin Genovefa, Koenigsberg, 1860, and *B. Seuffert,* Die Legende von der Pfabzgräfin Genovefa, Wurzburg, 1877. Similar sagas of wives suspected of infidelity and punished by exposure are discussed in the XI chapter of my investigation of "Das Inzestmotiv in Dichtung und Sage" (the incest motive in fiction and legends).

[57] The same accentuation of the animal motive is found in the saga of Schalû, the Hindoo wolf child; compare Jülg, Mongolische Märchen (Mongolian fairy tales; Innsbruck, 1868).

The Duke of Brabant and Linnburg died, without leaving other heirs than a young daughter, Els, or Elsam by name; her he recommended on his death bed to one of his retainers, Friedrich von Telramund. Friedrich, the intrepid warrior, became emboldened to demand the youthful duchess' hand and lands, under the false claim that she had promised to marry him. She steadfastly refused to do so. Friedrich complained to Emperor Heinrich, surnamed Vogler, and the verdict was that she must defend herself against him, through some hero, in a so called divine judgment, in which God would accord the victory to the innocent, and defeat the guilty. As none were ready to take her part, the young duchess prayed ardently to God, to save her; and far away in distant Montsalvatsch, in the Council of the Grail, the sound of the bell was heard, showing that here was some one in urgent need of help. The Grail therefore resolved to despatch as a rescuer, Lohengrin the son of Parsifal. Just as he was about to place his foot in the stirrup *a swan came floating down the water drawing a skiff behind him.* As soon as Lohengrin set eyes upon the swan, he exclaimed: "Take the steed back to the manger, I shall follow this bird wherever he may lead me." Having faith in God's omnipotence he took no food with him in the skiff. After they had been afloat on the sea five days, the swan dipped his bill in the water, caught a fish, ate one half of it, and gave the other half to the prince to eat. *Thus the knight was fed by the swan.*

Meanwhile Elsa had summoned her chieftains and retainers to a meeting in Antwerp. Precisely on the day of the assembly, a swan was sighted swimming up stream (river Schelde) and drawing behind him a skiff, in which Lohengrin lay asleep on his shield. The swan promptly came to land at the shore, and the prince was joyfully welcomed. Hardly had his helmet, shield and sword been taken from the skiff, than the swan at once swam away again. Lohengrin heard of the wrong which had been done to the duchess, and willingly consented to become her champion. Elsa then summoned all her relatives and subjects. The place was prepared in Mayence, where Lohengrin and Friedrich were to fight in the emperor's presence. The hero of the Grail defeated

Friedrich, who confessed having lied to the duchess, and was executed with the axe. Elsa was alloted to Lohengrin, they having long been lovers; but he secretly *insisted upon her avoiding all questions as to his ancestry, or whence he had come,* saying that otherwise he would have to leave her instantaneously and she would never see him again.

For some time, the couple lived in peace and happiness. Lohengrin was a wise and mighty ruler over his land, and also served his emperor well in his expeditions against the Huns and the heathen. But it came to pass that one day in throwing the javelin he unhorsed the Duke of Cleve, so that the latter broke an arm. The Duchess of Cleve was angry, and spoke out amongst the women, saying: Lohengrin may be brave enough, and he seems to be a good Christian; what a pity that his nobility is not of much account *for no one knows whence he has come floating to this land."* These words pierced the heart of the Duchess of Brabant, and she changed color with emotion. At night, when her spouse was holding her in his arms, she wept, and he said "What is the matter, Elsa, my own?" She made answer, "the Duchess of Cleve has caused me sore pain." Lohengrin was silent and asked no more. The second night, the same came to pass. But in the third night, Elsa could no longer retain herself, and she spoke: "Lord, do not chide me! *I wish to know, for our children's sake, whence you were born;* for my heart tells me that you are of high rank." When the day broke, Lohengrin declared in public whence he had come, that Parsifal was his father, and God had sent him from the Grail. He then asked for his two children, which the duchess had borne him, kissed them, told them to take good care of his horn and sword which he would leave behind, and said: "Now, I must be gone." To the duchess he left a little ring which his mother had given him. Then the swan, his friend, came swimming swiftly, with the skiff behind him; the prince stepped in and crossed the water, back to the service of the Grail. Elsa sank down in a faint. The empress resolved *to keep the younger boy Lohengrin, for his father's sake, and to bring him up as her own child.* But the widow wept and mourned[58] the rest of her life for her beloved spouse, who never came back to her.

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[58] The Grimm Brothers, in their German Sagas (part II, p. 206, etc.), quote six further versions of the saga of the Knight with the Swan. Cer-

On inverting the Lohengrin saga in such a way that the end is placed first,—on the basis of the re-arrangement, or even transmutation of motives, not uncommonly found in myths,—we find the type of saga with which we have now become familiar: The infant Lohengrin, who is identical with his father of the same name, *floats in a vessel upon the sea and is carried ashore by a swan. The empress adopts him as her son, and he becomes a valorous hero.* Having married a noble maiden of the land, he forbids her to enquire as to his origin. When the command is broken he is obliged to reveal his miraculous descent and divine mission, after which the swan carries him back in his skiff to the Grail.

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tain fairy tales of the Grimm Brothers, such as "The Six Swans" (No. 49), 'The Twelve Brothers" (No. 9), and the "Seven Ravens" (No. 25), with their parallels and variations, mentioned in the 3d volume of the "Kinder- und Hausmärchen," also belong to the same mythological cycle. Further material from this cycle may be found in Leo's "Beowulf," and in Goüre's "Introduction to Lohengrin" (Heidelberg, 1813).

(*To be continued*)

Periscope

Allgemeine Zeitschrift f. Psychiatrie

(Band LXIX, Heft 6)

1. The Influence of Typhoid Fever upon Existing Mental Diseases. Wm. H. Becker.
2. The Mortality, the Causes of Death, and the Pathological Findings in Epileptics. R. Hahn.
3. Contribution to the Ability to Choose One's Place of Abode. Dr. Schott.
4. An Hysteria Analysis and Its Teachings. Bruno Saaler.

1. *The Influence of Typhoid Fever.*—That psychoses often improve during or after an attack of typhoid fever has often been noted as it has also been in connection with other febrile conditions. There have been cases of typhoid at the Weilmünster Asylum since its opening in 1897 and the author was able to find records of 82 cases. Of these 22 died. A study of the 60 which recovered showed that in 8 there was perceptible mental improvement lasting at least several weeks, in 6 the improvement was great enough to warrant discharge, while in 46 cases the improvement was inappreciable. The majority of the patients who improved belonged clinically to the dementia præcox group. The author draws the following conclusions: (1) That not infrequently, improvement in the mental condition occurs after an attack of typhoid, he can confirm. (2) The result depends upon (*a*) the variety of psychosis, (*b*) the age of the patient and (*c*) the length of time the psychosis has lasted before the outbreak of the typhoid. (3) Idiocy, epilepsy, general paresis and the senile psychoses are almost entirely uninfluenced. Dementia præcox is often improved even to the point of justifying discharge. Manic depressive on account of its circular or periodical course scarcely justifies a positive conclusion. Other functional psychoses did not occur in the author's material.

2. *Mortality in Epileptics.*—From 1891 to 1911 there died at the Hochschweitzschen Epileptic Asylum 537 patients, which calculated upon a yearly population of 720 gives a mortality of 3.5 per cent. The author exposes in a number of tables the pathological findings in these cases and draws the following conclusions: (1) The mortality of epileptics is not much greater than that of the general population; in the case of those in this institution 3.5 per cent. (2) Though the danger to life in epileptics as far as the disease itself is concerned, is not so great, they are nevertheless exposed to too many dangers, in the outside world more than in the asylum, which latter in general acts for them in a protective and conservative manner. (3) The particular age at which the epileptic is exposed to most danger is indeterminable, in fact all ages seem about the same, though, as in the general population, mortality increases with age. (4) The chief danger to epileptics is in the convulsive attacks. In 63.4 per cent. of those dying in fits there was status. After status, epileptic coma was most fatal (21.6 per cent.). Heart troubles carried off 14.4 per

cent., pulmonary inflammations 11.1 per cent., accidents and wounds 7 per cent. In general epileptics do not appear to be more threatened than other patients with diseases of the brain. Tuberculosis and other febrile infectious diseases find victims no more frequently here than in other conditions. 8.5 per cent. succumbed to a severe seizure but in only 4 of these cases was an adequate physical cause not found. Suicide is not always preventable. (5) Autopsies on epileptics show many interesting findings but nothing which would throw any light upon the symptoms observed during life.

3. *Ability to Choose One's Place of Abode.*—Discussion as to the ability and right of an imbecile tramp and petty criminal to choose his residence, which discussion arose on account of a dispute between officials as to which district should be charged for his keep, he having been adjudged as irresponsible and needing asylum care. The author thinks it is the affair rather of the officials than the psychiatrist.

4. *An Hysteria Analysis.*—An account of the case of a married woman of twenty years of age who presented a long train of hysterical symptoms, such as pains, anesthesia, astasia-abasia, cough, vomiting and hysterical delirium. She was found to be of somewhat defective intelligence, childish, and of intensely perverted sexuality, having been addicted to irrumation and finding no satisfaction in intercourse in the natural way. The author explains the whole train of symptoms after the most approved Freudian style as dependent upon an attempt upon her part to repress the morbid instincts—to her natural—and to substitute for them, those proper to a married woman. He summarizes, what he considers the most important conclusions justified by his analysis of this case, as follows. (1) "The neurosis is the result of an attempt to give up a sexual perversion, in favor of normal sexual activity." (2) "The neurosis is the negative of the perversion. (*a*) The affect proper to the suppressed desire-conception, is changed into its contrary (anxiety instead of pleasure) while the suppressed conception itself, through the aid of symbolism, is converted into another conception-complex (production of the anxiety conception). (*b*) The somatic symptoms are in the main the result of innervations which conduct themselves antagonistically to those which played a rôle when the sexual desire-complex was not suppressed, (*e. g.*, increase of a physiological spasm instead of its solution)." (3) "The analysis furnishes proof of the existence of an infantile sexuality, upon the basis of which the perversion of the sexual instinct arises." ("Being perverse, does not mean become perverse, but remained perverse.") (4) "It makes it probable that infantile sexuality represents the male component of the bisexual plan of man." (5) "Characteristic disturbances of sensibility justify the conclusion that sexual centers actually exist in the brain, and indicate the possibility that in woman a center with preponderant male characteristics exists in the right, and one with preponderant female characteristics, in the left, hemisphere. The left normally reaches its full development, first at the time of puberty, relieving to a certain extent the right, which then takes on other functions." (6) "The history of this case supports the teachings of Fliess with regard to the 28 and 23 day periodicity of biological occurrences, in that it makes it appear probable that the activity of the sexual centers is subject to this periodicity." (7) "It brings proof of the correctness of Fliess' theory as to the relationship between the nose and the sexual organs."

C. L. Allen (Los Angeles)

Book Reviews

DER KOPFSCHMERZ. SEINE VERSCHIEDENE FORMEN, IHR WESEN, IHRE ERKENNUNG UND BEHANDLUNG. Von Dr. Siegmund Auerbach, Frankfurt a. M. Julius Springer, Berlin.

In this small monograph of 132 pages we find a comprehensive and valuable summary of our present-day knowledge of this large and illy understood group of disturbances. There is probably no single symptom so often badly treated as headache, largely because of the lack of available descriptions. These have been made good in a number of the systems which have been published of late, hence Auerbach's treatise is not as necessary as has been the case.

He is particularly strong on the organic side but is weak in his consideration of hysterical and other so-called functional headaches. False headaches, called elsewhere by the reviewer the headache-excuse habit, the headaches of dementia præcox, cyclothymia and related conditions are not mentioned.

Taken all in all, however, this is a valuable monograph.

JELLIFFE.

GRUNDRISS DER PSYCHIATRISCHEN DIAGNOSTIC. Von Prof. Dr. Raecke. August Hirschwald, Berlin.

The reviewer had the opportunity of commenting on the value of the first edition of this book in the JOURNAL OF NERVOUS AND MENTAL DISEASE, Vol. 36, page 509. The framework of the original edition is maintained; the author has added to the new edition the Binet-Simon's tests, other intellectual tests, examinations of the vestibular apparatus, and the modern methods of examinations of malingering insanity. Indeed the book is of considerable value and can be very highly recommended to teachers in psychiatry and neurology as well as to the general practitioner.

KARPAS.

HANDBUCH DER NEUROLOGIE. Herausgegeben von M. Lewandowsky. Dritter Band. Spezielle Neurologie. Julius Springer, Berlin.

This most advanced and up-to-date work in neurology contains, in the third volume, a number of important monographs.

Dr. Vogt of Wiesbaden contributes chapters on Congenital and Developmental Defects of the Brain, Nonpurulent Encephalitis, Cerebral Palsy of Children, and Chorea minor. The editor, Dr. Lewandowsky, writes on Injuries to the Skull and Brain, Diseases of Cerebral Circulation, Abscess of the Brain, Sunstroke, and Tetanus.

A highly valuable and complete chapter on Syphilis of the Nervous System is that by E. Forster of Berlin, who with Dr. Lewy of Munich also contributes a chapter on Paralysis Agitans. Both of these chapters contain new material.

Spielmeyer of Freiburg has a monograph on Paresis and Sleeping Sickness which is most excellent.

Among other chapters two may be picked out as classical, one by Henschen on Intra-cranial Affections of the Ocular Pathways and the other by Barany on Affections of the Cochlear and Vestibular Mechanisms. These two monographs are very complete and will prove of much service to the neurologist as well as the specialist in eye and ear work.

Other chapters take up Brain Tumors, by Redlich; Animal Parasites of the Brain, Henneberg; Congenital Hydrocephalus, Kalischer; Acquired Hydrocephalus, Bonhoeffer; Chronic Diffuse Brain Disease, Cassirer, Lyssa, Schaffer; Exogenous and Endogenous Intoxications by Bumke, Hartmann and Schrottenbach.

This splendid handbook improves upon continued acquaintance and should be invaluable to every working neurologist acquainted with German. No such work has existed. It leads them all and should prove of great service to neurology.

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The Fitness of Environment. An Inquiry Into the Biological Significance of the Properties of Matter. By Lawrence J. Henderson, Assistant Professor of Biological Chemistry, Harvard University. The Macmillan Company, New York. $1.50.

"We may be sure that, whatever successes science shall in future celebrate within the domain of teleology, the philosopher will never cease to perceive the wonder of a universe which moves onward from chaos to very perfect harmonies, and, quite apart from any possible mechanistic explanation of origin and fulfilment, to feel it a worthy subject of reflection. From this point of view, however, science need expect no interference, but without any last vestige of former shackles may pursue the search after mechanistic explanations of all natural phenomena.

"At length we have reached the conclusion which I was concerned to establish. Science has finally put the old teleology to death. Its disembodied spirit, freed from vitalism and all material ties, immortal, alone lives on, and from such a ghost science has nothing to fear. The man of science is not even obliged to have an opinion concerning its reality, for it dwells in another world where he as scientist can never enter.

"I cannot hope to provide more than a very imperfect illumination of certain aspects of teleology in this venture upon the foreign of metaphysics, and I should wish to be understood as very doubtful of my success in stating what seem to me some of the philosophical conclusions to be drawn from the fitness of the environment.

"There is, however, one scientific conclusion which I wish to put forward as a positive and, I trust, fruitful outcome of the present investigation. The properties of matter and the course of cosmic evolution are now seen to be intimately related to the structure of the living being, and to its activities; they become, therefore, far more important in biology than has been previously suspected. For the whole evolutionary process, both cosmic and organic, is one, and the biologist may now rightly regard the universe in its very essence as biocentric."

This is the substance of this delightful series of essays.

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Original Articles

A CONTRIBUTION TO THE PATHOLOGY OF MYASTHENIA GRAVIS[1]

By Sydney Kuh and Morris Braude

RUSH MEDICAL COLLEGE

The case we are about to report seemed to us of more than ordinary interest for two reasons. Firstly, no one of the sixty-odd cases of which post mortem records were accessible to us showed anatomical findings parallel to those in the central nervous system of our patient, and we hope that the results of our investigations may be a step—however slight—in the direction of a clearer understanding of the mysterious pathogenesis of myasthenia gravis. Secondly, the clinical history of about four hundred cases, which we studied, makes no mention of one phenomenon to which our patient, himself a physician, called our attention.

Clinical History.—Dr. J. N. Holland, aet. 50, physician, examined April 3, 1902. Father died at the age of 74 from Bright's disease, mother at the same age from apoplexy. No other disease of the nervous system in the family. Patient claims to have enjoyed perfect health up to five years ago. He served during the entire Civil War, without a day of illness. About five years ago, he noticed that while in a stooping position, when applying forceps, his head became heavy and dropped forward. This recurred from time to time under similar conditions, and became so troublesome occasionally that he had some one of those present support his head. At about the same time, he noticed off and on—lasting for a week or so at a time—some difficulty in moving the tongue and a drooping of the right eyelid. Then a numb "pinched" feeling became noticeable about the face and some weakness in raising the arms. After speaking for a short while, the voice became "trembly." There was an increasing inclination to take deep inspirations. All these symptoms would disappear when patient rested, and recur upon exertion. When he arose in the morning he felt "as well as he ever had in his life." While under observation he would quite frequently speak of this peculiar phenomenon, which led him to believe that there was an element of hysteria in the case.

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[1] From the Anatomical Laboratory of the University of Chicago. Read at the meeting of the American Neurological Association held at Washington, D. C., May 5, 1913.

Patient had never used alcohol to excess, and had been a total abstainer for the last 12 years, but he smoked excessively (12–18 cigars a day), chewed tobacco and drank a good deal of coffee. A great deal of exposure. No venereal disease of any kind.

He was tall and stout, 255 lbs., and had splendid color. He was above average intelligence. At times during his stay at the hospital he was depressed and irritable but was usually cheerful and amiable. The pupils were equal in size and reacted normally to light and accommodation. The extrinsic eye muscles acted well, excepting the levatores palpebrarum, which at times showed some paresis. This weakness was more frequently noticeable and more marked on the right than on the left side. There was at times distinct weakness of the muscles supplied by the upper two branches of the facial, while the lower branch seemed intact. Speech was perfectly normal when patient began to talk, but after a few minutes it became thick, distinctly "bulbar" in character and very soon was quite unintelligible. It was not nasal in character, and the mobility of the soft palate was unimpaired. The muscles of mastication were readily exhausted, so much so that for about two weeks before patient came for examination, he had avoided meats and other "hard" foods.

Objectively there was no other evidence of paresis of the tongue, but the patient stated that he could not move it well from side to side, after having talked for a little while. Fibrillary twitching was not observed at any time. No objective disturbance of sensibility in the fifth nerve. Pulse rather rapid, 88, of good quality, radial artery neither especially rigid nor tortuous. Respiration became rapid and superficial upon the slightest exertion. While the patient was examined, the head would from time to time sink forward upon the chest.

The only other muscles in which loss of power upon exertion was noticeable were the deltoids on both sides, and the long extensors of the fourth and fifth fingers of the right hand. There was no distinct muscular atrophy anywhere, but the thick layer of adipose tissue might well have concealed a slight wasting of the muscles. Response to mechanical stimuli was normal. There was no rigidity.

The patient repeatedly called attention to a symptom which we have not seen noted elsewhere, namely, that passive movements as well as active ones would cause a sensation of fatigue in the affected muscles. On account of the patient's intelligence and training, we are inclined to consider this statement as of some importance.

The deep reflexes in the upper extremities could not be elicited when the patient was first examined, but were distinct, though a little less vigorous than normal during a remission of the disease later on. Those of the lower extremities were always present when sought for, though never of normal intensity. On account of the dyspnea caused by every little exertion, it was not considered advisable to subject him to a more thorough exploration and the lungs and abdominal organs were not examined. The heart was normal in size; no murmurs were audible, nor any accentuation of second sounds.

Electric tests were applied to the left deltoid muscle only, and in this normal reaction to the galvanic current was found. But an examination with the faradic current showed the existence of an exquisite myasthenic reaction. Two days later patient called for an examination again, this time with such pronounced dyspnea, caused by walking less than half a block, that he was directed to go to a hospital for treatment. That same afternoon (April 6, 1902), he was admitted to the Post-Graduate Hospital, where he remained up to the time of his death. Drs. L. F. Barker and A. Church saw him there in consultation, and both of them agreed in the diagnosis of myasthenia gravis.

Absolute rest in bed, central galvanization and later on hypodermics of strychnine were tried, but unfortunately without success. The urine was examined and found to be of neutral reaction, sp. gr. 1,025 and free from sugar and albumin. Temperature at no time either below or above normal range, and pulse rate ordinarily between 80 and 88, at times sinking to 74 or rising to 100. The sleep was frequently disturbed and since rest seemed so essential, and the patient would toss a good deal at night when awake, one dose of strontium bromid, gr. xx, was frequently given at night.

For some time the patient seemed to be improving. He could again eat meat. The ptosis and dysarthria became less marked, and he declared that he was so much stronger generally, and no longer suffered from dyspnea when he moved in bed. The number of respirations sank from 30 to the minute at the time of his admission to 18–22. On April 21, the myasthenic reaction was again sought for, and while it was still unmistakably present, it took a good deal longer to exhaust the muscles than 17 days before. The patient was then permitted to sit up in an easy-chair and to take a few steps around the room, apparently without injury. On the afternoon of the following day, he had been out of bed, and while one of us was with him, he suddenly complained of feeling exhausted, vomited a little mucus, and then his respiration very rapidly became more and more labored. He was conscious during the entire attack, believed himself to be dying, bid farewell to those around him, and from minute to minute reported his sensations to us. An injection of strychnine sulphate gr. 1/30 was given and later on, when the patient complained bitterly of his suffering, a hypodermic of morphine gr. ¼ was added. During the entire attack, which lasted about half an hour, the pulse remained remarkably strong, regular and slow. Finally respiration ceased altogether, and we thought that the end had come, when after a minute or so, the patient began to breathe again, at first very rapidly and superficially, then more and more normally. It was only when this unexpected relief came, that the pulse became both weak and rapid, and remained so for the rest of the day. This attack began at 2:15 P.M., at 2:45 the respirations were 52 to the minute, at 3:00—38, at 3:50, we found a pulse of 112.

At 4:30,	temp. 98°,	pulse 120,	resp. 28.
5			24
5:30		112	
8:30		108	
11		100	20

After this attack, the patient was kept in bed. His pulse remained rapid, 92–100, while the respirations went down to 20. He complained a good deal of difficulty in expectorating although he coughed but very rarely, and of weakness of the abdominal muscles, in attempting to go to stool. During the night between April 23 and 24, after he had moved about a great deal in bed, he had a slight attack of dyspnea, but he felt fairly well the next morning. The following day he woke up feeling rather weak and ill, and in the afternoon at 2 o'clock, he had another attack similar to the one of April 22, excepting that now his pulse soon became very rapid and small. After about half an hour of the most horrible dyspnea, he said that now he was getting over the attack, spoke a few additional words and then lapsed into unconsciousness. His breathing became less rapid, irregular at times, of a distinct Cheyne-Stokes type, while the pulse was very rapid at one moment, and down to 58 beats the next. Even after cardiac action had ceased entirely, he gasped for breath a few times, and finally died at 3:30 P. M., after having been unconscious for an hour.

Microscopical Examination of Central Nervous System.—The bulk of the tissues was fixed in 10 per cent. formalin and Mueller's fluid, while a number of small pieces were hardened in alcohol for subsequent staining with Nissl's methylene blue. Celloidin and paraffin respectively were used for imbedding and sections cut at from 7.5 to 20μ for the nerve cell stains, at 15 to 30μ for the other methods used. Only for Marchi's method were thicker sections cut (45μ).

Each segment of the spinal cord was examined and such pieces of the rest of the central nervous system as will be described later, altogether about 400 sections.

The following staining methods were employed: Weigert's myelin sheath stain, and Pal's modification of the same, Mallory's chlorid of iron hematoxylin, Ford-Robertson's toluidin blue, thionin, Nissl's methylene blue, toluidin blue counterstained with erythrosin, uranium carmin, Van Gieson's stain, safranin, various stains commonly employed in the demonstration of bacteria, Weigert's fibrin stain and the same author's stain for elastic fibers.

Conus medullaris: The smaller vessels of the pia mater show a moderate degree of sclerosis as do also some of those within the spinal cord. Many of them are engorged with blood, especially those within the gray matter. The central canal is occluded and surrounded by a fairly large mass of glia tissue. The subpial layer of neuroglia is quite thick and contains but few nuclei. In several of these sections one and in one specimen two symmetrically placed bodies are seen where the anterior root approaches the periphery of the cord which in shape and size closely resemble a large motor nerve cell, contain a distinct nucleus and nucleolus and have processes resembling axones, but do not give the characteristic reactions either with methylene blue or toluidin but stain more diffusely,—evidently some very large glia cells. One section shows some increase of glia tissue in the columns of Burdach near their posterior margin, another one a similar condition in the columns of Goll, also near the periphery. In one of the anterior roots there is a small body, approximately circular in outline, composed of concentrically arranged wave-like fibers which stain deeply with iron hematoxylin. A smaller similar body appears on the opposite side in another section.

In the subpial layer of glia a large number of corpora amylacea may be seen and in some sections minute capillary hemorrhages into the posterior horn, posterior column, substantia gelatinosa and posterior root zone are found, presenting all of the characteristics of a very fresh extravasation (red blood corpuscles of normal form and color, surrounding tissues unaltered) and not associated—as far as can be ascertained—with any structural changes in the walls of the vessels, hence very probably hemorrhages by diapedesis.

The neurocytes—especially those of the anterior horns—contain a large amount of yellowish pigment which stains black with Marchi's stain. The Nissl bodies of the normal cells are rather coarse here as they are throughout the spinal cord, some few however show the changes of a more or less pronounced central chromolysis.

One of the capillaries of an anterior horn is thrombosed. This thrombus is found in a vessel the walls of which show no changes whatever and consists of polymorphonuclear cells. Such thrombi, as we will soon see, are found in large numbers in other parts of the central nervous system.

Both the anterior and the posterior roots appear perfectly normal, excepting that the latter contain a large number of very thin, fine medullated fibers.

Lumbar region: The same degree of congestion is found in the blood vessels of pia mater and cord, in the latter especially pronounced in the gray matter. Corpora amylacea seem not quite as numerous as in the conus medullaris, but are still seen in large numbers. One section stained with iron hematoxylin shows two bodies, the one in an anterior, the other in a posterior root, consisting of wave-like fibrils, as already described. In some parts of the posterior columns the neuroglia seems slightly thickened. A section from the level of the first lumbar segment shows a larger sclerosed patch, in this same region, in which Weigert's hematoxylin stain fails to reveal the presence of any nerve fibers, but which is surrounded by normal axones on all sides. Another smaller area of sclerosis encloses a corpus amylaceum. The glia forming these patches contains but few nuclei.

In this same region, a small patent central canal is visible. A small hemorrhage surrounding a capillary greatly distended by red blood corpuscles is found in one posterior horn of a section from the upper part of the lumbar cord. We have already noted the occurrence of a large number of fine fibers in the posterior roots; even more of them are present here than in the lower levels.

The various stains employed for the demonstration of the minute structure of the nerve cells reveal nothing pathological, unless an excess of pigment be so considered. Marchi's stain shows the presence of a few degenerating nerve fibers in both anterior roots, but not more of them than we frequently meet with in the examination of tissues taken from perfectly healthy individuals.

Thoracic region: In its lower portions the place of the central canal is again taken by a fairly thick mass of glia cells and fibers, but in the 8th thoracic segment the canal reappears and is patent until we reach the upper end of the dorsal cord, when it again is lost in a mass of glia tissue. The amount of blood within the vessels decreases as we reach higher levels of the spinal cord, but there is still a well-marked congestion to be seen.

The subpial glia net seems rather broader than normal in the lower half of this region, approaches more nearly to the usual quantities in the higher segments. Here too we note an increase of connective tissue fibers in the posterior columns, rather more diffuse in distribution and less extensive than in lumbar cord.

Axones of small caliber are still very numerous in posterior roots and now become more frequent in the anterior roots as well, with a distinct tendency to gather in small bundles composed entirely or almost entirely of such thin fibers; in the latter area (anterior roots) they decrease again in frequency towards the upper end of the thoracic region, while in the former their number remains approximately constant throughout. Corpora amylacea, while still present, are rapidly diminishing in quantity.

The nerve cells in the main present a normal appearance, excepting again for the larger amount of pigment. One neuron, however, in an anterior horn is distinctly pathological: in it we see healthy Nissl bodies only near the periphery of the cell-body, while its central portion is occupied by a fine dust but faintly tinged with blue; the nucleus and nucleolus are displaced excentrically, the former less deeply stained than the nuclei of other cells of the same type within the section. Another specimen of this series shows two cells in the column of Clarke lying close together, which present slight changes in the Nissl bodies indicative of a beginning central chromolysis. Only two thrombi were found: the one is placed at the inner margin of the posterior horn, the other one found in another section—in the column of Burdach; both of them are in capillaries and consist of polymorphonuclear cells.

Cervical region: The central canal is still occluded, the blood vessels distended by erythrocytes everywhere, the corpora amylacea continue to decrease in numbers as sections from higher levels are examined, the subpial layer of glia becomes thinner. In the lower cervical region the first traces of "Krause's Respirations Bündel" are found. No changes of any kind can be detected in its fibers. Special attention was given to this tract in specimens stained according to Marchi's method, but no degenerating axones could be seen. In the anterior roots only very few of the thin fibers—so prevalent a little lower down—are found, in the posterior roots they are still more common, although less so than in sections from the thoracic region.

The glia seems somewhat increased in the posterior columns, in some sections markedly so near the posterior median fissure. . In sections taken from the level of 5th cervical segment a bundle of aberrant nerve fibers is found. This bundle can be traced from the dorsal portion of Burdach's column, runs forward to near the anterior end of the apex and then seems to divide into two bundles, the one of which can be followed forward for but a short distance within the white matter, while the second one runs outward in a double curve resembling an ~, enters the gray matter and is lost at a point very near the posterior margin of the cord.

After the level of the 4th cervical segment has been reached the ascending root of the spinal accessory becomes very distinct on both sides; its fibers appear normal in size and numbers and do not stain black with Marchi's stain.

The next higher level shows several minute fresh hemorrhages, one each in both of the anterior and posterior horns as well as a few throughout the white matter. But very few smaller fibers are now seen in either the anterior or the posterior roots. The amount of glia in the posterior columns does no longer distinctly exceed the normal.

One specimen from this region shows three capillary thrombi composed of polymorphonuclear cells in one anterior horn; they lie quite close together and probably occlude the branches of one arteriole. In a second section four similar thrombi are found in the same region and one in the anterior horn. One cell with a relatively large nucleus shows central chromolysis and seems to have lost both axone and dendrites; a second cell in its immediate neighborhood has lost almost all of its tigroid and neither nucleus of the spinal accessory nerve appears normal. Again another section shows three capillary thrombi of the same type as those just described near the tip and a partially thrombosed capillary near the posterior margin of its one anterior horn; near the posterior-median portion of this same horn are two cells of normal form and size with distinct nucleus, nucleolus and processes, the body of which has taken a diffuse light blue stain and does not show any Nissl bodies. On the opposite side a capillary thrombus is found in the crossed pyramidal tract. Another section shows probably the same cells in the postero-median portion of the anterior horn which have just been described; the one of them in this specimen contains only a few Nissl bodies and those are but poorly stained and very irregular in size and outline, the nucleus is distinct but no nucleolus can be seen, the pigment—so abundant in most ganglion cells—is absent, the dendrites are devoid of tigroid. In the second cell we find neither nucleus nor nucleolus, the tigroid is again absent in the processes, split up into a fine dust in the cell-body; here there is an abundance of yellowish pigment. On the opposite side of this same section in a spot corresponding very closely to the region just described, is a cell with central chromolysis, a nucleolus which is broken up into several irregularly formed and deeply stained fragments, no nucleus; the remaining Nissl bodies, *i. e.*, those around the periphery of the cell body and in the dendrites are indistinct and more diffusely stained than in normal specimens. A section from the upper cervical region shows three thrombosed capillaries in one anterior horn, two of them near its tip, the third one near its center.

Marchi sections from two levels of this portion of the cord show here and there a degenerating nerve fiber, never arranged in groups and less in number than one should expect to find in a perfectly healthy nervous system of a man as old as our patient was.

Lower medulla: Occasionally a nerve fiber stained black by Marchi's method; none of these are seen, however, either in the spinal roots of the 5th nerve or the fibers of the nervus accessorius Willisii. Otherwise perfectly normal. In a section corresponding approximately to Obersteiner's level 145 d. *i. e.,* showing the beginning of the nucleus of the hypoglossal nerve and the nucleus ambiguus, we note the following: the cells of the nucleus arcuatus contain quite a large amount of yellowish pigment, otherwise they appear normal; the same may be said of the cells in the nucleus hypoglossi and ambiguus. Small capillary thrombi are seen in the following locations: two within the posterior columns, the same number right near to the one nucleus ambiguus, one within the nucleus n.hypoglossi and one in the nucleus arcuatus. Within the fibræ arcuatæ externæ lie a small artery and vein between which is found a collection of polymorphonuclear cells.

Another section from this same region shows the same conditions excepting that here capillary thrombi are found as follows: two each in the one nucleus arcuatus and in the lemniscus, one each just posteriorly to the nucleus of the n.XII, at the base of the nucleus funiculi gracilis, in the middle portion of this same nucleus and a third a trifle back of this. The nucleus gracilis of the opposite side also contains three capillary thrombi.

A third specimen from this same level shows small extravasations of leucocytes into the perivascular spaces and walls of some of the larger vessels. Corpora amylacea are again seen in larger numbers. The cells of the nucleus of n.XII are very beautifully stained and show no deviation from the normal, excepting for an excess of the pigment so frequently mentioned. Capillary thrombi are distributed throughout the specimen in the following way: One in the one pyramidal tract, on the other side two in this same locality, in olivary body one, in the lemniscus two, in the nucleus funiculi gracilis two on either side and one just externally to the nucleus funiculi cuneati.

The next section contains a small hemorrhage near the outer edge of the nucleus cuneatus, evidently again quite fresh. No less than 18 thrombi are visible in the pyramids (one on either side), near the median line in the lemniscus 5, in nucleus ambiguus 1, and very close to it (on one side 1, on the other 4) near the nucleus XII 1, near cerebellar tracts 3, and in nucleus cuneatus 1.

Another section from this same level contains still more of these thrombi: In the fibræ arcuatæ 1, in the pyramids 4, in the nucleus arcuatus 1, in the olivary body 1, in the lemniscus 3, in the nucleus lateralis 5, in the nucleus XII 2, in the nucleus cuneatus and other parts of the upper portion of the medulla oblongata 19, a total of 36. Again some small extravasations of leucocytes are found in the walls of smaller veins, two of which are located in the pyramids, while the other 3 or 4 are scattered throughout the rest of the section. Near the spinal nucleus of the glossopharyngeal nerve a capillary is greatly distended by blood corpuscles, the outer layer of these being composed of erythrocytes, its center by a large number of polymorphonuclear leucocytes.

These thrombi seem decidedly more frequent nearer the periphery of the medulla and such other places where larger blood vessels enter it, as *e. g.,* the sulcus longitudinalis.

A section which could not be examined entirely as its dorsal portion was folded in the mounting, nevertheless shows 26 thrombi. Of these 7 were in the pyramids, 4 in the olivary bodies, 6 in the lemniscus, two near the nucleus lateralis, 3 in the nucleus cuneatus, 2 in the nucleus gracilis and the same number in the fibræ arcuatæ. At the inner margin of this last named nerve-tract is seen a small artery with extravasation of leucocytes into its wall and perivascular space. The cells of the olivary bodies contain a good deal of pigment, more than those in other parts, though it is not lacking in the latter either. The pia mater in the sulcus longitudinalis anterior is quite rich in cellular elements.

The next sections of the medulla oblongata are from the *lower end of the fourth ventricle, just below the nucleus of the X.* Here Weigert's hematoxylin shows very nicely several recent hemorrhages into the floor of the fourth ventricle. Near the largest of those the tissues seem torn, but no secondary changes are seen either in the blood corpuscles or in the region surrounding them, so that these hemorrhages too must have occurred very shortly before the patient's death. The vessels themselves seem perfectly normal and no tear in their walls can be found. On the other side of the section in the same region similar changes are noted, though less extensive.

Portions of the hypoglossal nerve (extramedullary) are visible on both sides and show no changes with this stain. The next specimen is one through the level of figure *145 of Obersteiner* and is stained with thionin: On one side a hemorrhage has taken place between the nuclei of n.XII and X. In its center is a small vein engorged with blood, but with healthy walls and the form and size of the erythrocytes is again unchanged. The ependyma proper of the fourth ventricle appears normal, but under it are found corpora amylacea in very large numbers. The nuclei of the nn.hypoglossi show no changes on either side, excepting for the occurrence of a larger amount of pigment. The same may be said of the nucleus of the 10th nerve and of those of the nucleus ambiguus. Neurophagocytosis, which has been seen here and there in other sections, occurs more and more frequently as we reach higher levels, affecting the smaller nerve cells, such as those of the olivary bodies and lemniscus, very much more than the larger cells of the motor type. These same neurocytes are again especially rich in pigment.

Large numbers of polymorphonuclear thrombi are again in evidence: one is placed immediately adjoining the postero-lateral end of the nucleus of n.X, five within the lemniscus, ten in the olivary bodies, one in the nucleus arcuatus, four in the pyramids. These thrombi clearly have a tendency to occur in groups, *i. e.*, several capillaries in the same neighborhood will frequently contain them.

Another section from this same level presents in the main the same picture. We note thrombi as follows: near nucleus of n.X (as in preceding section) 1, near its outer side again 1, in fibræ arcuatæ internæ 4, in olivary bodies 9, in lemniscus 4, laterally of olivary bodies 1 and in the pyramids 5.

Again we find the walls of some of the smaller arteries and veins an infiltration with leucocytes.

In the following section from this level we find the same hemorrhage and thrombus near the nucleus of the n.X. In that of the eighth nerve a vein is distended by erythrocytes and numerous polymorphonuclear leucocytes. Complete thrombi formed by the latter type of cells are seen: in corpus restiforme 2, in "kleinzelliger Hypoglossuskern" 1, in substantia gellatinosa 1, in fibræ arcuatæ internæ 2, in olivary bodies 8, in lemniscus 3, in pyramidal tracts 2. The wall of a small artery in the nucleus lateralis is infiltrated with leucocytes. In the region of the fibrae arcuatæ internæ a very small perivascular hemorrhage is found, evidently of recent origin. The walls of some of the capillaries contain dark pigment very finely divided. In many of them, though their lumen remains patent, some polymorphonuclear cells are seen.

Marchi specimens of this level show nothing abnormal, especially in the roots of the nn.X and XII. This stain brings out beautifully the pigment in the nerve cells. Level fig. 145 h. (Obersteiner): Iron hematoxylin shows pretty numerous examples of neurophagocytosis. Toluidin blue shows normal neurocytes excepting for the pigmentation which is most marked in the cells of the nucleus olivaris inferior. This same nucleus contains 3 polymorphonuclear thrombi and a fourth one is found just externally to the same, two near the nucleus of n.VII.

Corresponding to figure 157 in Obersteiner: Weigert's hematoxylin: shows motor and sensory nucleus of n.V and fasciculus longitudinalis posterior, everything normal. Pal's modification: two fresh capillary hemorrhages into anterior part of pontine fibers. Pronounced pigmentation of nerve cells. Other sections stained by this method contain several minute hemorrhages into brachium conjunctivum. One treated with uranium carmine shows a very small extravasation of blood just externally to the nucleus of n.V. Van Gieson's stain brings out very beautifully the nuclei of nn.V and shows them to be perfectly normal. There are a number of arterioles visible with marked perivascular infiltration; some few veins are similarly affected, though to a lesser extent. Numerous specimens of neurophagocytosis, again especially in smaller nerve cells. Corpora amylacea have become quite infrequent. Polymorphonuclear thrombi were found: in brachium conjunctivum one on the one side, three on the other, in corpus restiforme 2, in and near the pontine fibers 29. In this section more than in any of the preceding is the tendency pronounced for thrombi to appear in groups. A second section stained in the same way shows several small fresh capillary hemorrhages, two into the brachium conjunctivum of the one side, one into that of the other, a fourth one into the sensory nucleus of the n.V, another one into the region of the pontine fibers. In this latter area is seen a small artery with a central polymorphonuclear thrombus and with perivascular infiltration. Vessels showing the latter condition are increasing in frequencv and are distributed irregularly throughout the section as are also additional 37 small thrombosed vessels.

Corresponding to fig. 161 in Obersteiner and showing the roots of the 4th nerve as well as the cerebral roots of the 5 Weigert, Pal and iron-hematoxylin demonstrate the existence of two small hemorrhages, the one directly in front of the decussation of n.IV, the other one in the lemniscus lateralis, nothing else worth mentioning.

Nissl and thionin specimens showing the nucleus of oculomotor nerve: some neurophagocytes in nucleus corporis quadrigemini anterioris. A large amount of pigment in the nerve cells, well marked in those of n.III, in some instances it seems to have crowded the nucleus to the periphery of the cell body. In the walls of some of the capillaries a fine yellow pigment is found. A few of the cells of the nucleus III show central chromolysis of a moderate degree, in one a vacuole is seen. The number of corpora amylacea is again increasing. The lumen of only a few vessels is completely filled with polymorphonuclear cells and one of these is in the nucleus III, several capillaries in which only a few polymorphonuclear cells are seen. Neurophagocytosis is frequent.

Of the cortex the psychomotor centers of both the upper and the lower extremity were examined. But very little of any interest was found.

In the arm *area* the nerve cells appeared normal throughout, excepting for a slightly increased amount of pigment of the same variety that was found in other parts of the central nervous system. In the blood vessels only the existence of an occasional small group of leucocytes in their perivascular spaces is worthy of mention. These leucocytes were not of the polymorphonuclear type, nor were any such seen within the vessels proper. With stains suitable for this purpose a very dense network of cortical fibers can be demonstrated. All through the cortex quite a number of very thick fibers with "rosenkranzfoermigen Auftreibungen" are found. Occasionally a myelin drop may be seen, several times the size of a normal nerve fiber in diameter. Marchi's stain shows nothing of importance.

Leg center: Here Marchi's stain brings out a very few degenerating myelin sheaths, certainly not more than are frequently observed in the normal brain. One very small recent subcortical hemorrhage is seen. The nerve cells here as everywhere else contain a good deal of pigment, more so the large motor cells than any others. Amyloid bodies are few in numbers. There is no increase of glia in the cortex. Quite a number of examples of neurophagocytosis, again affecting more especially the smaller neurocytes. There is some perivascular infiltration and pigmentation of the walls of the capillaries. In a few sections a large pyramidal cell may be seen here and there in a state of central chromolysis, but there are very few indeed of these. In regard to the medullated nerve fibers of the cortex nothing can be added to what has already been said about those in the arm center. I wish again to emphasize the absence of polymorphonuclear thrombi.

Four large frontal sections through the *region of the optic thalamus* were stained with toluidin blue and examined most carefully, in order that the presence or absence of such thrombi in this part of the central nervous system might be ascertained: none of them were seen nor were any other findings noted which might be of use in an attempt to solve the problem before us.

Sections stained with Weigert's fibrin stain showed the absence of the latter in the thrombi. Attempts to demonstrate the presence of bacteria within these sections were equally negative in their results.

The elastic fiber stain demonstrated nothing unusual as to the moderate degree of arteriosclerosis which exists throughout the entire nervous system.

Summary of Pathological Findings.—(1) Although examined serially from the lowest to the highest levels, the spinal cord presented but few characteristic changes, the most important consisting in occasional small areas of vascular sclerosis, recent hemorrhages, excess of glia tissue in regions in which normally it should not occur, and in the presence of corpora amylacea.

(2) An unusual finding was the presence of an aberrant bundle of fibers in the cervical region.

(3) There were present in the higher levels of the cord capillary polymorphonuclear thrombi and chromatolytic and pigmentory changes in the nerve cells.

(4) There was a rapid increase in the number of these capillary thrombi in the upper cervical and a still greater number in the medulla oblongata in the regions of the nuclei of the lower cranial nerves, in the pyramids and sensory tract.

(5) In the proportion as the number of these thrombi increased, in just such proportion did the nerve cells in their vascular tributaries show chromatolytic and pigmentary changes.

(6) Although less pronounced, the regions of the pons and corpora quadrigemina were also the seats of a moderate number of these thrombi, which were likewise accompanied with corresponding changes in the nerve cells.

(7) There were relatively few vascular changes in the cortex and none in the optic thalami.

(8) Examination of the muscles (about 50 pieces) showed only changes repeatedly described by others: great variability in the size of the muscle fibers, the presence of pale fibers, simple and degenerative atrophy, fatty degeneration, increase in the number of the sarcolemma nuclei; recent hemorrhages, interstitial perivascular infiltration of lymphocytes, plasma and mast cells.

Macroscopically no trace of thymus gland.

The Conception of the Disease in the Light of Our Own Findings.—The morbid changes in the nervous system seem so unusual and so obtrude themselves on the investigator, that it becomes reasonable to suppose the association between these changes and the symptoms of the disease to be more than a mere matter of chance. That the thrombi are purely accidental findings, seems to us improbable because of their peculiar localization, their greater frequency in the very parts of the central nervous system to which the symptoms point as the probable seat of the disease. That they are not purely agonal seems to be shown by the occurrence of degenerated nerve cells and fibers, where these thrombi are more frequent. The great variability in the intensity of the symptoms, the periods of remissions and intermissions seem to suggest vascular changes as a not improbable cause. While fully realizing that the findings in one case do not permit of the drawing of final conclusions as to the pathology of a disease, we do hope that the work just reported may mean a step—however slight—in the right direction. The question of the cause of these minute thrombi is one to be solved in the future, should they have the significance which we are inclined to attribute to them.

General Summary.—(1) Myasthenia gravis is a disease probably of neurogenic rather than myogenic origin.

(2) Certain peculiar vascular changes in selected regions of the central nervous system may account for the distribution of its symptoms and the usual mode of death.

(3) These vascular changes in our case consisted in the presence of minute polymorphonuclear thrombi most numerous in the pons and medulla, thus accounting for the preponderating bulbar symptoms of the disease.

(4) This association between morbid findings and symptoms is not a mere matter of chance, but probably one of cause and effect.

(5) Our case presented two unusual features, one clinical, not described elsewhere, namely a feeling of fatigue produced by passive movements, and one pathological, the occurrence of an aberrant bundle of fibers in the cervical region of the cord.

(6) The cause of these thrombi is unknown.

In closing we wish to express our appreciation to Drs. L. F. Barker and R. Benseley both for the permission to use the laboratories of the University of Chicago and for the time given to the looking over of specimens and of verifying the findings.

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THE RÔLE WHICH HEREDITY PLAYS IN INDUCING EPILEPSY IN CHILDREN SUFFERING FROM INFANTILE CEREBRAL PALSY[1]

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While the diagnosis of infantile cerebral hemiplegia is relatively simple, one may not with the same ease decide whether the child thus affected will superadd an epilepsy in later life. The percentage of liability in which this latter disorder complicates the cerebral palsy of childhood is variously estimated; ranging between 40 and 70 per cent.

What are the factors upon which one may prognosticate any given case will have epilepsy in later life? One ought not to let the matter lie in doubt if there be any more definite criteria to aid. We should not trust to time to give us the solution, inasmuch as epilepsy may not follow the initial palsy for years, even thirty years after the original palsy, during which time the parents and relatives must wait with the greatest anxiety and apprehension. Then, too, we ought to be prepared to take the greatest precaution to ward off a sequential epilepsy if one may be fairly sure it is to occur; the spasmodic state once fully inaugurated in a child affected with cerebral palsy rarely ever ceases. We have known of but one case where this latter result has obtained.

At first thought one might readily conclude that the site and nature of the original insult to the brain would give us sure prognostic signs, but a careful review of the considerable literature of our subject shows that such facts are not of much help, even though one were able to determine the extent and nature of the lesion in a given case of infantile hemiplegia by the clinical symptoms. As a matter of fact epilepsy followed in the most widely variant types of palsy. The severity of the palsy is no sure indication upon which we may depend. Indeed, Freud states that the most intractable epilepsy follows in the wake of infantile hemiplegia when the latter is so little in clinical evidence that one may only postulate its presence by vague and transient exhaustion phenomena which follow the fit. This type constitutes his well-known paradoxical group of "palsy without palsy." Thus it is seen that spasmodic infantile hemiplegia shows the widest and most variant types of palsy. The palsy may range from a complete, disabling hemiplegia or a hemiplegia in which the paretic state is scarcely discernible even by the most rigid tests.

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[1] Read at the annual meeting of the American Neurological Association, Washington, May 7, 1913.

In spite of the fact that many disease processes spread readily in the infant brain, such as foci of inflammation or trauma, one may not rely on this principle in infantile cerebral palsy, inasmuch as the latter disease process is most often not inflammatory in the strict sense, and it is often quiescent when the neurologist is first consulted, undergoing but little or no change in many years. Therefore if the site, extent and nature of the lesion in these cases may not aid us, to what more certain criteria may we turn our attention?

It is known to all that recent heredity studies have forced the conclusion that in the large group of the so-called idiopathic type of genuine epilepsy heredity plays an important if not the most important rôle in the causation. It is present perhaps in seventy per cent. of this type of epilepsy. While this law undoubtedly applies to those individuals in which congenital mental defect obtains independent of the more general deteriorating mental process due to the epilepsy itself, such research is pertinent to our inquiry and thesis, more especially so because a neurotic predisposition also enters to a considerable extent in the causation of cerebral palsy of infancy itself.

We have therefore decided to inquire into a large material of infantile cerebral palsy and compare the heredity rôle in causation of the palsies plus epilepsy with that seen in the so-called genuine disease. We are aware, of course, that many are not wanting who hold that infantile cerebral palsy and epilepsy are but two expressions of the same disease process in the developing fetal and child life. If an infantile cerebral paralytic may be made epileptic by the interposition of a slight trauma or the perturbing influence of puberty—and most frequently no cause for the first fit is brought forward in the history of spasmodic infantile cerebral palsy—how much more potent in causation should be the presence of a spasmophilic or simple neurotic heredity in influencing or deflecting the function of a brain already crippled. The importance of an inquiry of this sort has a distinct bearing upon genuine epilepsy, as it has been shown that 35 per cent. of all epileptics show a preponderance of one-sided convulsions, thus indicating the possible dependence of such a disorder upon a cerebral lesion. Further, more than 12 per cent. of all epilepsies follow in the wake of well marked cerebral palsies of infancy. This proportion obtains in the admissions at the Craig Colony for Epileptics, at which institution our inquiry was made. In our heredity study we were blocked at the outset from making the issue final, owing to the inability of direct comparison of a large material of palsy cases *with* and *without* epilepsy. A great number of palsies without epilepsy were nowhere obtainable, although all the large clinics of New York were laid under contribution, from which fact one might legitimately infer that the percentage of palsy without epilepsy is even greater than that ordinarily held. In the small material drawn from private sources and clinics, in which a sequential epilepsy could be absolutely excluded, a history of a spasmophilic and neurotic constitution was negligible. We had to content ourselves, therefore, with comparing the heredity history of infantile cerebral palsy associated with epilepsy with that obtainable in the so-called idiopathic cases. The data under investigation consisted of 443 cases of palsy with epilepsy, and 443 suffering from the genuine disorder. This material for convenience of comparison is tabulated and charted, and shows in general terms that in the 443 hemiplegic epileptics in the first 3,500 cases admitted to the Craig Colony there were 133 in which no record of hereditary influences in the ancestry could be obtained, which is a little less than one third. In the remaining 310 cases, or 70 per cent., a definite record was found of hereditary influences and the most important of these bearing on the present study are shown in the chart. Epilepsy and convulsions occurred in 115 instances, or approximately 25 per cent., and in a number of cases several of the ancestors of a given patient were afflicted; alcoholism was mentioned 110 times; insanity 46 times; idiocy and feeble-mindedness in 10 instances; fainting spells in 17 instances; hysteria, neurotic constitution, migraine, etc., in 100 instances; and apoplexy and paralysis in 38 instances.

While tuberculosis, rheumatism, cancer and other constitutional diseases may not be of importance in determining epilepsy, these disorders have been tabulated to show the frequency with which they were mentioned in the ancestry and which might be a factor in producing a lowered resistance in the patient,—tuberculosis was mentioned in 97 of the ancestors and rheumatism in 76.

An equal number of epileptics without hemiplegia have been tabulated. The remarkable similarity is at once manifest. The amount of known heredity is about the same in the two disorders. Alcoholism is a little more frequent in idiopathic epilepsy while spasmophilia occurs in but 17 cases more than in hemiplegic epilepsy. Then, too, tuberculosis is greatly in excess in the idiopathic epilepsy group. Otherwise the comparisons are not essentially dissimilar.

But few data of other observers are at hand for checking up our study. Bratz, in comparing a small material of less than 50 cases, states that the heredity in idiopathic epilepsy and hemiplegic epilepsy is not dissimilar, and his study tallies with ours that there is no essential qualitative or quantitative difference between the heredity in the two conditions. He mentions no rôle the heredity may play in exciting an infantile hemiplegia to take on a sequential epilepsy.

Fuchs's study based upon an analysis of but 100 cases showed some sort of heredity element in only 29 per cent. of the palsy material, while in the 44 cases which later became actually epileptic an heredity history was present in 34 per cent. Thus the lesion itself, if one may be permitted to argue in this manner, played but one third of the rôle in causation. In other words, the ratio of heredity to palsy was about 1 to 4, while heredity to hemiplegic epilepsy was 3 to 4.

The fact that epilepsy usually occurs much earlier in life in hemiplegic epilepsy than in the idiopathic type may be counted both for and against out contention in this paper. Yet it is frequently seen, as mentioned before, that hemiplegic epilepsy occurs

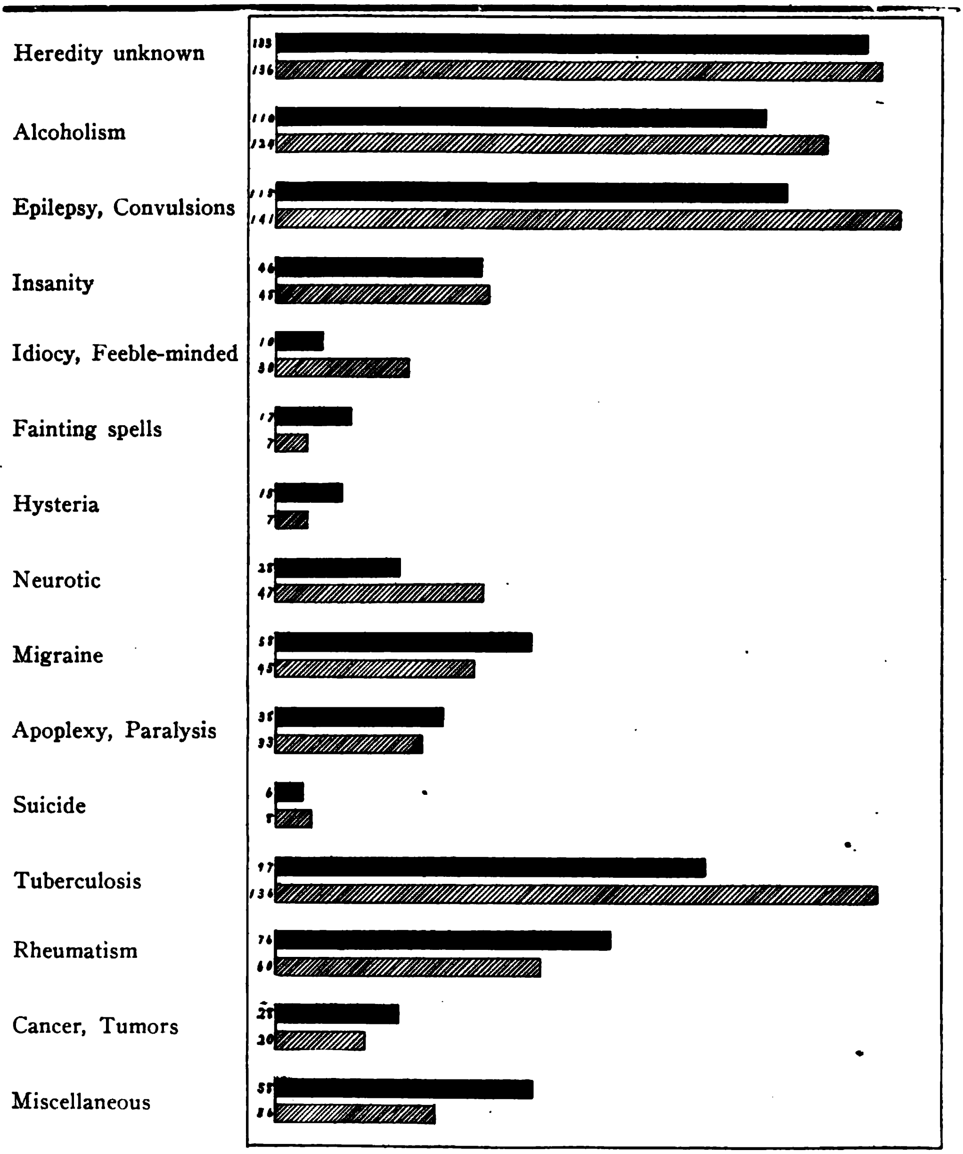

CHART No. 1. Comparison of the cases of Epilepsy with Hemiplegia, indicated by the heavy upper line, with an equal number of cases of Epilepsy without Hemiplegia, indicated by the lighter, lower line.

years after the original cerebral trauma and wherein no new palsy symptoms have been shown to occur, as far as can be observed, to account for the added fits. Again, genuine seizures are far from rare in hemiplegic epileptics. Even absences and psychic attacks are not wanting. Usually the same factors, such as indigestion, fright, etc., are equally alleged to have caused both types of convulsions. One knows to what degree the alleged excitants can be considered as the true cause of the genuine disorder, and we presume to class the initial palsy and the sequential alleged causes together and place our greatest reliance upon the absence or presence of an heredity factor in the specific case and prognosticate by that chiefly if not solely.

From the material which we have here submitted, we believe we are justified in concluding that the heredity factor in hemiplegic epilepsy is only a little less in evidence than that of genuine epilepsy, and that the prognosis as to a sequential epilepsy following in the wake of a given case of infantile cerebral palsy should be based upon the presence and degree of spasmophilic or simple neurotic history, and that this latter fact should be given as much or even more weight than the site, nature and degree of the initial cerebral injury as expressed in the palsy.

Our best thanks are due to Dr. William P. Shanahan, Superintendent of the Craig Colony, for permission to use the extensive clinical data and case records at the Colony on which material of this study has been made.

CEREBRAL PALSIES WITHOUT DEMONSTRABLE ANATOMICAL FINDINGS[1]

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Cases of cerebral palsies without demonstrable lesion in the brain and without implication of the pyramidal tracts have been frequently reported. The cases however have by no means a common pathology. Perhaps the most usual form of these palsies consists of hemiplegia of toxic origin, such as those that occur after or during nephritis (Jacobson (1), Brodier (2) and others); or during pulmonary tuberculosis, pneumonia or as the result of lead poisoning and puerperal infection (Jacobson), or in alcoholics (Eichorst (3)). They may be also the result of disturbances of the circulation consisting of changes in blood vessels (Hochhaus (4) and Wernicke (5)); or due to vasomotor disturbance of toxic origin causing fugacious edemas (Le Calvé (6)).

While the aim of this paper is to call attention especially to the cases of infantile cerebral palsies without a clear-cut demonstrable lesion it is impossible to exclude from brief reference, for the purpose of elucidation, these cases, as well as those in which a lesion of the brain is found but in which at the same time no degeneration of the pyramidal tracts can be demonstrated. Such for example are the cases reported by Binswanger (7), Babinski (8) and Oppenheim (9), in which tumors of the brain have caused paralysis but in which degeneration of the pyramidal tracts has been lacking.

In addition to these there is also a group of cases of hemiplegia without disease of the pyramidal tracts in which is found in the basil ganglia a lesion consisting of lacunae described by Marie (10) under the name of état criblé, instances of which have been reported by Mikulski (11). In this group may be included the cases exhibiting lesions of the temporal lobe (Mikulski), of the lenticular nucleus (Wilson (12) and Oppenheim (13)), of the caudate nucleus and optic thalamus (Hoestermann (14)), of the optic thalamus (Bischoff (15), Nothnagel (16), Wernicke (17) and Oppenheim (18)) and the case cited by Marie and Guillaine (19) of lesion of the red nucleus with secondary degeneration of the tegmentum, the cerebellar peduncle, and posterior longitudinal bundle.

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[1] Read at the thirty-ninth annual meeting of the American Neurological Association, May 5, 6 and 7, 1913.

There is then beside these a large group of cases that are described as infantile cerebral palsies in which the symptoms are characteristic and comparatively uniform in which again however the pathology is varied.

Excluding the cases of porencephalon and atrophy in the motor and other regions, associated with degeneration of the pyramidal tracts there is a comparatively small number of cases on record in which there is little or no demonstrable lesion either in the cortex or the motor tracts of the spinal cord.

In a number of these cases no true degeneration is found in the pyramidal tracts but a fineness of the fibers (Spiller (20), Binswanger (21)); or a scarcity of fiber (Ganghofer (22)), or incomplete myelination of the fibers (Haushalter & Collins (23)), or agenesis or imperfect development of the pyramidal tracts (Spiller (24), Ganghofer, Steinlechner-Gretschischnikoff (25) and Otto (26)), or finally atrophy of the pyramidal tracts (Ganghofer, Steinlechner-Gretschischnikoff).

Cellular changes in the cortex more or less marked have been described in some cases, the exact significance of which I believe is still open to discussion.

In Otto's cases there was a lack of development of the cortical cells especially the large pyramidal cells, and an entire absence of Betz cells. The absence of secondary degeneration in the pyramidal tracts is difficult to explain in this case if we accept as true that the fibers of the pyramidal tracts are directly connected with the Betz cells.

In one of Rolly's (27) cases there was some ganglion cell degeneration of moderate grade, added to proliferation of the glia and small vessels. Otherwise except for a slight external hydrocephalus there was nothing abnormal.

In some of the cases the cells of the cortex show little or no change. In a second case cited by Rolly of bilateral spasticity in a child who died at the age of 2 months there was nothing pathological except a proliferation of the glia and blood vessels.

In Haushalter and Collin's case there was no abnormality of the Rolandic cortex and the pyramidal tracts were normal except for incomplete myelination.

In Ganghofer's case the findings were negative except in one there was a scarcity of fibers observed.

In the three cases described by Spiller very slight pathological changes were found. In one of his cases an idiot with contracture of the feet, and inability to support the body or to use the hands, the brain showed no gross lesions. The Betz cells were not numerous and were smaller than normal and the fibers of the pyramidal tracts were remarkably fine.

In a second case, an idiot who could not talk, walk, or support his body and who was probably spastic and had increased reflexes in the legs but not in the arms which could be used, there was no gross or microscopic change in the brain or cord.

The third case was that of a girl who could not walk or talk, nor could she use the hands in voluntary effort. The Betz cells were numerous and showed change which may have been due to post mortem degeneration. The cells of the spinal cord were normal. The fibers of the crossed pyramidal tracts of the cervical region were very fine and finer than the columns of Goll or of the pyramidal tracts in a normal child of the same age.

This case he looked upon as one of agenesia of the pyramidal tracts as was true he believed of his first case. In his second case he inclined to the belief that the nerve fibers in the pyramidal tracts "had not grown downward into the cord in normal numbers so far as the lumbar region, although the cervical region was well supplied."

Railton (28) described a case of spastic hemiplegia in an idiot of 3 years in which there was a depression forming a shallow groove parallel with and involving the fissure of Rolando. Microscopically the pons, medulla and cord were perfectly normal.

There was some diminution in the number of the large ganglia cells and increase in the neuroglia only.

More recently changes in the cells have been noted by Finkelnberg (29), Spielmeyer (30) and Hoestermann which they believe explain the cause of the paralysis as well as the preservation of the pyramidal tracts in these cases.

Finkelnberg's case was one of infantile spastic paraplegia which beside a moderate degree of hydrocephalus showed the presence of an atrophy of the cortex in the motor region with preservation of the large ganglion cells (Riesenpyramidenzellen) and in which secondary degeneration of the pyramidal tracts was absent. The cells in the cortex in the first to the fourth layers were diminished in number and irregularly arranged, while the Betz cells were normal. He did not believe that the hydrocephalus explained the degeneration of the cortex but believed that the atrophy of the cortical layer produced a functional disturbance affecting the motor conductibility, at the same time leaving the trophic influence intact.

Hoestermann cited a case of spastic diplegia in a woman of 34 years who had been an idiot and an epileptic since birth in which there was porencephalon of the right occipital lobe and some atrophy of the entire right hemisphere. There was a sclerotic atrophy of a great part of the cortex in the temporal, parietal, and occipital lobes. The spinal cord was practically intact.

In the cortex there was an irregular placing of the small pyramidal cells extending from the layer of the large ganglion cells to the molecular layer, consisting of a slight atrophy of the cells generally but which was very intense in the molecular layer. The large ganglion cells showed some irregularity but were in a normal position on the right side though not on the left. The pyramids in the medulla oblongata were normal except the left which was slightly lighter in color than the right. The von Monakow's bundle was not diseased.

In a second case of idiocy with convulsions, left-sided spastic palsy and inability to walk or talk, there was found microgyria. The small pyramidal cells in the right central convolution were reduced in number and were irregularly placed. There was no diminution in the large ganglion cells and these were normal. The left central convolutions were normal.

The left pyramidal tract was smaller than the right and smaller in proportion than the posterior columns, while the left anterior horns of the spinal cord were smaller than the right and poor in ganglion cells.

In a third case of Hoestermann, a young man, with strabisinus, left hemiplegia, spasticity and increased reflexes, the left hemisphere was slightly larger than normal and there was a porencephalic defect in the right temporal, occipital and frontal regions. The cortex in all its layers was poor in cells, particularly the molecular layers, while the small pyramidal cells were increased in number. The ganglion cells were present but were less numerous than normal. The spinal cord was intact.

In a fourth case of paralysis of all members in a girl of 9 years gradually developing since 4 years of age there was external hydrocephalus, hemorrhage in the right caudate nucleus and in the right optic thalamus of old date. There were, besides, irregular orientation of the pyramidal cells in the central convolution and almost complete disappearance of the fibers of the cortex as shown by the Weigert method.

The cord was negative except for an embryonal type of the anterior pyramidal tract in the thoracic region and a paleness of Helweg's triangular field in the cervical region.

Hoestermann believed that the atrophy of the cells in the upper layers of the cortex caused palsy while the preservation of the lower layers guaranteed intactness of the trophic influence upon the pyramidal tracts.

Spielmeyer described a case of hemiplegia dating 2 years before death. The right hemisphere weighed 200 grams less than the left. The red nucleus, the optic thalamus on the right side and the left side of the cerebellum were reduced in volume and showed evidences of secondary atrophy. The pyramidal tracts in the spinal cord were intact.

In the cortex on the right side the cells of the cellular layer to the depth of the third zone were completely absent but in the deep layers a few cells were seen. There were also some large and middle sized cells in the third layer but the large ganglion cells showed no difference on the two sides.

In a former paper (31) I reported a case of spastic paraplegia (Case 1) dating from childhood, in a patient who died at the age of 72 years. At the autopsy nothing was found abnormal macroscopically. A microscopic study of the cortex, pons, medulla oblongata, and spinal cord showed nothing pathological. The cells of the cortex appeared to be normal although no Betz cells were found in the sections from the paracentral region. In the spinal cord no degeneration was present and the examination was negative except for a fineness of the fibers of the crossed pyramidal tracts.

I shall in this report add two other cases, one of which was briefly presented to the Philadelphia Neurological Society on March 25, 1910 (35) and one for the privilege of reporting which I am indebted to Drs. Charles Frazier and William G. Spiller.

CASE 2.—L. S. was admitted to the Philadelphia Home for Incurables May 12, 1895, and died October 26, 1909, at the age of 27. The family history was lacking, except that a brother and sister were healthy.

At the time of her admission she stated that she had been suffering from jerky movements as long as she could remember.

Examination made at the time of her admission resulted as follows: There were constant involuntary movements, choreiform in character in arms and legs and face and more marked on the left side. Any attempt at voluntary effort increased the movements. The left hand was in constant motion. The legs were rigid, especially the left, which could not be extended beyond a right angle. There was distinct weakness of both the left arm and leg. The grip in the right hand was much stronger than in the left. There was no palsy of the face, and the tongue protruded straight and in the median line.

The knee jerk was increased on the right side but could not be elicited on the left side on account of the rigidity. There was an attempt at ankle clonus on the right side.

The pupils were equal and reacted to light. The speech was a little hesitating. She walked with distinct weakness of the left leg, the weight of the body coming down on the left toe.

The patient was undersized and while the head was small it was not out of proportion to the rest of the body. The bitemporal diameter was 11.5 cm., the biparietal 13 cm., the occipito-frontal 18 cm., occipito-mental 20.5 cm., trachelo-bregmatic 16.5 cm.; and the occipito-frontalis circumference 50 cm.

The autopsy revealed nothing macroscopically amiss in the brain or spinal cord. The weight of the brain after having been in formaline for about two weeks was 1,167 grams. The average weight of the normal brain being 1,230 to 1,350 grams, taking into consideration the fact that the brain had been in formaline for 2 weeks, it could be estimated that the brain weighed considerably less than the average. The convolution of the brain showed no deviation from the normal.

Sections were made from the paracentral regions, from the pons medulla and from the cervical, thoracic, and lumbar regions of the cord.

The pia in the paracentral regions was thickened, and infiltrated with large mono-nuclear round cells, and connective tissue cells, the latter predominating. There was some peri-vascular distention and slight peri-vascular round cell infiltration in the superficial layers of the cortex in this region. The Betz cells were numerous and stained well, and the other cells of the cortex could not be said to be diminished in number or altered in their orientation.

No pathological change could be found in the white matter of the pons, medulla oblongata or spinal cord, either by the Weigert method or with the nuclear stain. The pyramidal bundles in the pons were perhaps a little smaller on the right side than on the left but otherwise no abnormality was noted.

The cells in the anterior horns of the spinal cord stained well and showed nothing abnormal except that in many there was a considerable amount of yellow pigment.

In a word there was no demonstrable pathological condition to account for the spastic diplegia dating probably from birth or at least early infancy.

CASE 3. B. J. About 10 years of age, died 2 days after a subcutaneous incision of the plantar fascia and Achilles tendon. The pathological diagnosis after autopsy was chronic mitral and bicuspid endocarditis, broncho-pneumonia, fatty degeneration of the kidney and liver. The patient was operated on at the University Hospital by Dr. Charles Frazier, having been transferred to this institution temporarily from the Vineland Training School.

The patient was a large plump boy with low mentality since birth. The facial expression was vacant, and he did not talk. Both arms were spastic, but he used the arms freely, grasping with each hand fairly well. It was impossible however to fully extend the elbow joint on either side. At rest the fingers of the right hand were extended. The bicipital jerks could not be elicited.

The lower limbs were somewhat smaller than normal from the knees down, and he was unable to stand. There was talipes-equinovarus on both sides, and also a marked contracture of the Achilles tendons. The ham-string tendons were slightly contractured. The patient was able to flex the hips well but could not extend them fully.

The brain was quite small, measuring in its long diameter but 6 inches. Twenty-seven brains at the neuropathological laboratory of the University of Pennsylvania were measured and it was found that the average length was a little over seven inches. No abnormality of the convolutions was observed and a cross section of the brain was apparently normal in appearance.

Sections were made from the right and left paracentral regions, the basal ganglia on one side, the optic nerves, the medulla oblongata, the cervical, thoracic and lumbar regions of the spinal cord and of the anterior roots from the cervical and lumbar regions, and these were stained by the Weigert method and by thionin and hemalum.

The paracentral regions. By the Weigert method no degeneration of the white matter could be demonstrated. There could be seen however in the superficial layer of the cortex a fine network of fibers and nuclei.

By the nuclear stain the pia was found to be thickened in places and especially over the sulci, where it was markedly so. The process consisted of an increase of connective tissue fibers which were studded with numerous connective tissue cells, some mono-nuclear round cells and some red blood corpuscles. In other places the pia was slightly thickened but was not the seat of any disease process. In the cortex of the paracentral region there was considerable peri-vascular dilatation but no infiltration of round cells in the peri-vascular spaces was found.

By the thionin stain, many of the Betz cells in the left paracentral region stained normally. Some however stained poorly and showed other signs of degeneration. Some of the cells were swollen, had lost their processes and the nucleus had disappeared. The Betz cells seemed to be present in normal quantities. Sections from the right paracentral region showed practically the same process except here and there degenerated Betz cells were more numerous.

The cells in the other layers of the cortex appeared to present no abnormality as to position and numbers on the right side.

The optic chiasm and the optic nerves took the stain normally. The basal ganglia showed microscopically nothing pathological.

Sections from the medulla oblongata and from the cervical and lumbar regions of the cord were entirely negative with the exception of some insignificant changes of the cells of the anterior horns in the thoracic region consisting of atrophy of the pigment and displacement of the nucleus.

There was some slight degeneration of the anterior roots in the lumbar region. The pia of the cord was not diseased and no cause could be found for the degeneration of the anterior roots.

The pyramidal tracts of the cord stained well and showed no evidence of degeneration.

In this case the degeneration of the Betz cells was hardly extensive enough to explain a condition which had existed since birth, and the process described was not one which suggested that it had existed for a long time.

No satisfactory explanation of the paralysis has been offered in the cases in which the pyramidal tract is apparently normal and in which insignificant or no lesion is found in the brain.

The part played by the pyramidal tract in these cases presents an interesting problem. Intact pyramidal tracts imply that they are capable of transmitting motor impulses and in those cases in which the pyramidal tracts are normal, a cause for the palsy must be searched for above the spinal cord or even above the medulla oblongata and the pons.

It is reasonable to suppose that the cells of the cortex may be at fault, and disease of the cortical cells may occur without causing degeneration of the pyramidal tracts. That this is true has been shown by Binswanger who cited a case of tumor situated in the central convolution, one of tumor of the dura, and one in which there was a focus of softening in the cortex, with intact pyramidal tracts.

Babinski also cited a case of tumor of the motor cortex with intact pyramidal tracts. He believed that the irritation of the pyramidal tracts was sufficient to cause paralysis, but not intense enough to give rise to secondary degeneration.

Finkelnberg advanced the theory that the cause of the paralysis in his case was to be found in the atrophy of certain cortical cells which presided over function, while the preservation of the large ganglion cells (Riesenpyramidenzellen) insured a trophic influence upon the pyramidal tracts.

A similar explanation may be applied to the case described by Spielmeyer under the name of intracortical hemiplegia, above cited.

Hoestermann's cases may be cited as supporting this theory also. He emphasizes the importance of a careful histological study of the cortex, especially in the central convolution. He believed that when by atrophy the large ganglion cells (Riesenpyramidenzellen) are isolated from other cortical cells they are unable to exercise a functional influence upon the pyramidal tracts but the intactness of the large ganglion cells guarantees a trophic influence upon these tracts.

Another explanation he finds in the fact that different parts of the brain develop independently and these later become associated with each other, and hand in hand the function becomes established. If a lesion occurs before the functional differentiation but after the conclusion of the anatomical differentiation the function is destroyed, and finally if the organ is completely developed and both functional and anatomical differentiation is completed there occurs both a functional and anatomical defect.

The role of the optic thalamus must be considered at least in some of the cases of infantile cerebral palsies.

Bischoff (32) believed that the symptoms of infantile cerebral palsy can be caused by disease of the optic thalamus, and that an implication of the pyramidal tracts is not essential. Bischoff has shown that destruction of motor functions may be caused by cutting off of the sensory stimulation from the optic thalamus to the motor cortex. The optic thalamus appears he claims to be associated functionally with certain zones of the cortex by means of projection fibers.

Recently S. A. K. Wilson has described cases of progressive symmetrical lenticular degeneration, presenting bilateral involuntary tremor of all the limbs, rythmic usually, associated with spasticity of the limbs and face, dysarthria, dysphasia but little or no true paralysis. There is neurogliar proliferation, the glia replacing cells and fibers. There is also cavity formation and atrophy of the caudate nucleus. It is an extrapyramidal motor disease. Cirrhosis of the liver is a constant condition.

As the basal ganglia in my second case were normal it cannot be compared to this group of cases. Nor is there any resemblance to the cases of Oppenheim (33), which he described as pseudobulbar palsy occurring in children and exhibiting double athetosis, rythmic tremor, associated movements without sensory disturbance or implication of the intelligence. Vogt (34) found in these cases a marble-like appearance together with atrophy of the caudate and lenticular nuclei.

In my own cases with the exception of the first case in which no Betz cells were found, no change in the cells of the cortex could be demonstrated. The explanations offered therefore by Finkelnberg, Hoestermann and Spielmeyer do not satisfactorily apply to these cases.

What the cause of the paralysis was in my cases is yet undetermined. Whether it be due to some deficiency of nerve cell which baffles our present methods of study to demonstrate; whether it be due to faulty connection between various layers of the cortical cells; whether the nerve fibers in the pyramidal tracts have not developed in sufficient numbers in the lower levels of the cord (Spiller); or whether the fineness of the fibers interferes with their perfect function by offering undue resistance to the transmission of the motor impulse from the cortex and thus preventing the full motor discharge to reach the periphery (Rhein), is still a matter for study in the future to determine. It is difficult to avoid the conviction that one must look, for the explanation of these cases, to some quality of nerve cell or fiber which cannot by our present methods be demonstrated.

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SYPHILITIC BONE DISEASE OF THE SKULL[1]

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The literature dealing with the clinical manifestations of syphilitic bone disease of the skull is rather meager, and, indeed, in many of the leading textbooks on neurology, this subject does not even receive mention. Nonne in his exhaustive and up to date treatise—Syphilis und Nerven System—devotes very little space to syphilitic affection of the skull. It is difficult to state whether the scarcity of reported cases of luetic disease of the skull in the literature during the past several decades is due to the fact that this condition has become less frequent as a result of the marked advance in the therapy of syphilis or it has passed unnoticed by the clinicians because the symptomatic picture often simulates the disease of the brain itself. In Virchow's communication on constitutional syphilis the underlying pathological process of the osseous system including the cranium is discussed and brief reference is made to a case, that of a man of 32 with history of syphilis. At first he complained of pain in the lower extremities, back and left shoulder, and later convulsive twitchings of the lower limbs appeared, which were followed by paralysis of the right leg. He soon passed into coma and death ensued. Necropsy showed gummatous osteitis and periosteitis of the occipital parietal bones with pachymeningitis. Virchow quotes the cases reported by Lallemand and Samson and similar instances were recorded by Rayer and Gildemester and Hoyack in which gummatous osteitis and periosteitis of the cranium extended to the dura and the brain. Dittrich described a syphilitic case of the frontal bone with thickening, of the dura and involvement of the base and optic tracts. Two such cases were also observed by Dixon. Rittershausen's patient was 41 years of age, and gave a positive history of syphilis; he complained of severe headaches, and soon suffered an apoplectic stroke which was followed by deafness and paralysis of the left side of the body, including the face on the same side; contractures of the left extremity followed, which were accompanied by an occasional tremor. Soon coma developed terminating in death. Post-mortem examination showed osteophytes of the left parietal bone extending to the inner surface of the skull. Over the frontal lobes between the markedly congested dura and bony substance a yellow-whitish exudate was observed. Under the new formation of bony substances there were many areas of softening of the brain. Todd's patient at first suffered from headaches and weakness of the right arm, which was followed by epileptic seizures, being limited to the right side of the body. It is to be regretted that the last examination was a year and a half before patient's death. The autopsy revealed that the right temporal bone was thickened with a small bony prominence projecting from the inner surface of the left temporal bone. The dura in the region of the skull was thickened but not adherent. In the posterior and upper portions of the left parietal region the dura and pia were adherent to the brain but the cortical substance was normal. In Beck's case olfactory disturbances, intellectual disorder and excitement were in the foreground. At post-mortem tophi, mostly in the neighborhood of the sutures, were demonstrated. In addition there was a specific pachymeningitis with hemorrhage of the dura. Of Ludwig Meyer's eight cases of syphilis of the brain and skull, six presented changes of the cranium and the brain with meninges. In Mildner seventeen cases of syphilis of the nervous system, eight showed affection of the skull with secondary meningitis.

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[1] From the Psychopathic Department, Bellevue Hospital. Read at the thirty-ninth annual meeting of the American Neurological Association, May 5, 6 and 7, 1913.

Schüller remarks " that the luetic disease of the skull shows a well known predilection for the face and cranial vault; it occurs less frequently in the region of the base of the cranium, however in such instance the sphenoidal bone is most often involved. The formation of syphilitic granuloma originates from the periosteum or dura or from the mucous membrane or bone marrow.

" In all forms of syphilis, the cranium may be affected. Even in the early stages one may observe on the outer table of the frontal, parietal and temporal bones, tophi between the bone and periosteum. The underlying bone shows interstitial atrophy, the external table especially is traversed by numerous lacunæ and very rarely it is covered with periosteal aggregations and the lacunar spaces of the diploe are greatly widened. As a rule the tophi are healed whereby the previous interstitial atrophy of the bone undergoes sclerosis."

This author further states that in the later stages syphilis manifests itself in gummatous formation of bone, especially in the frontal, parietal, temporal and occipital. In still more advanced stages productive and destructive changes may occur which may be either localized or diffuse. Necrotic changes may often be observed.

Schüller declares that clinically syphilis of the skull may express itself not only in the typical nocturnal pains resulting from irritation of the contents of the skull but also by paralyses and irritative phenomena which are brought about by the involvement of the cranial nerves and the blood vessels—symptoms of basal meningitis. Furthermore, the clinical picture may simulate epilepsy, apoplexy and brain tumor.

The case which came under our observation is of great interest, not only because of the rarity of syphilitic bone disease of the skull but also because the clinical picture simuluated that of the cerebello-pontine tumor. In fact, had it not been for the postmortem examination, we would have had no opportunity to correct the erroneous diagnosis. The history of the case is as follows:

Family History.—As far as can be ascertained, there was no history of neurotic or vesanic taint in the family or its collateral branches.

Personal History.—The patient was a German woman, 45 years of age. Her early life was uneventful. She received a common school education, and was of a bright and cheerful disposition. She was of temperate habits, and was considered normal in every respect. Menses appeared at fourteen and were accompanied by no abnormalities until the age of 42, when they became irregular and ceased a year before death. She married at the age of fifteen years and four months, and had four children, two of which survived. One died of cholera at the age of three, and the other, a seven months baby, died of yellow jaundice. It was said that the patient herself suffered with jaundice while she was pregnant with this child. There is no history of miscarriages or stillbirths and a direct history of syphilis could not be determined. For twenty-seven years she had been sterile. It is also important to note that the Wassermann test in the husband was negative. It should be mentioned that after the birth of each child the patient would become obese.

There is no history of trauma to the head, and likewise, the patient had never been afflicted with sinus or ear affection.

The Development of the Nervous Disorder.—The patient was in fairly good health until July 5, 1909, when she began to complain of pain and swelling in the left knee and in the anterior portion of the right thigh. About the same time she experienced difficulty in walking and for this reason she was forced to take to her bed. For two years past she had suffered with excruciating headaches which were continuous and had also pains in both legs. In the summer of 1910 she seemed to show some improvement, as for a short time she was able to walk with the assistance of her crutches. In March, 1911, the hearing in the left ear became affected and at about the same time the left side of the face became paralyzed, but no definite date for the paralysis of the right external rectus could be fixed by the husband. It is important to emphasize that the patient was in several hospitals in New York City where she was subjected to active anti-luetic treatment, including salvarsan.

March 31, 1912, the patient had a convulsion which was limited to the face and upper extremities; soon after this it was noticed that the left eye-ball bulged and the sclera became congested. On the ensuing day she had a similar convulsion; following which she grew drowsy and seemed to pass into deep sleep. When she awoke she was delirious, spoke in a rambling manner, said that "she saw cats, and was restless and irrational."

She was admitted to the Psychopathic Department of Bellevue Hospital April 1, 1912, in an excited and delirious condition which subsided in a few days.

During her residence in the hospital, repeated somatic, neurologic and mental examinations were made, and the following is a brief summary:

A poorly nourished, cachectic woman, with flabby musculature and dry skin; some anemia; weak and irregular cardiac action; arteries were not thickened; there was some evidence of chronic nephritis and tuberculous process in the left apex.

Neurologic Status.—The olfactory sense was apparently intact; exophthalmus, especially of the left eye. Left purulent keratitis; the left pupil was covered by a purulent film, and for this reason its mobility could not be determined. The right pupil reacted to light and accommodation, and the sympathetic reflex was intact. The left external rectus was paralyzed, but the other ocular muscles were intact. The optic discs were normal, except for a right posterior staphyloma. The left corneal and conjunctival reflexes were abolished. The thermal and pain senses on the left side were much diminished, but the touch sense was not affected. The left side of the face was paralyzed. Hearing in the right was good, but very poor in the left. The other cranial nerves showed no pathological alteration. There were no sensory disturbances or evidences of pyramidal irritation. Reflexes of the upper and lower extremities were active; however, occasionally the knee jerks were difficult to elicit. The abdominal reflexes were active. The patient was unable to walk, nor was she able to assume a sitting or standing posture. There was some difficulty with coördination on the left side,—slight adiadokokinesis in the left hand and the finger and nose test was poorly performed. The spinal centers were not under control.

The Wassermann test in the blood was positive; the cerebrospinal fluid showed no increase of globulin or complement deviation; there were only ten lymphocytes per cm.

The patient complained of terrific headache and pain in the left arm. At times the pains were so intense that she cried aloud and evinced considerable agitation and anxiety. Quite frequently she vomited. She had several convulsions which were usually general; some of them were severe and others mild.

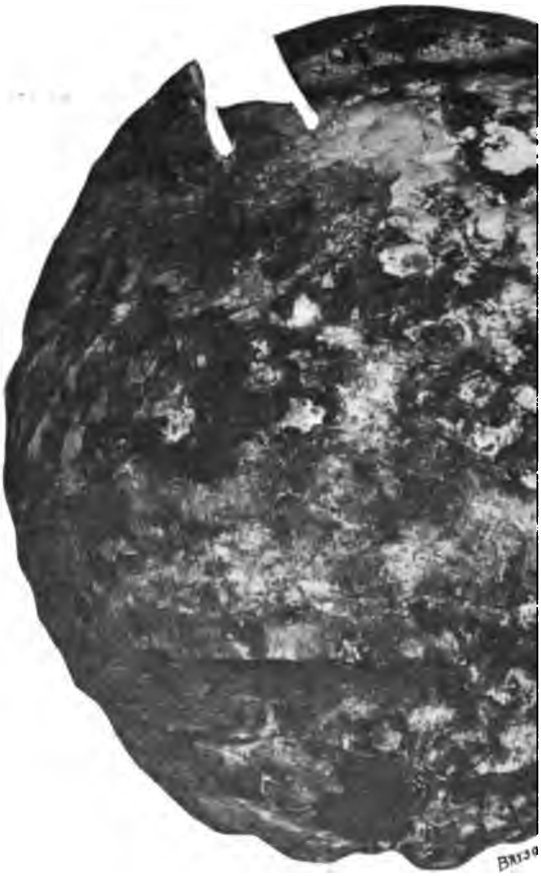
Mental Status.—Upon admittance to the hospital she was confused and restless; she spoke in a disconnected manner and her answers were irrelevant; she fancied that she saw animals and evidently spoke to imaginary persons. The underlying mood was one of depression and agitation. Because of the attention disorder, she was quite inaccessible for mental examination. In a few days she was quiet and composed, but depressed and complained of boring pain in the head. She was able to give a good account of herself and time orientation showed no defect. She was, however, somewhat amnesic for the episode of excitement.

Her general mental condition showed little or no variation; when her headache was very intense, she would become restless and agitated. On several occasions she showed similar excitements as on admission. Shortly before death she was delirious and excited. Death occurred May 16, 1912.

Post-mortem examination was made by Dr. Charles Norris and Dr. M. E. Hall, to whom we are indebted for the pathological report.

The tissue of the scalp was everywhere thickened, edematous and it was very difficult to peel off the tissue of the scalp from the calvarium; beneath the galea aponeurotica there was a large amount of semi-fluid and broken-down material. The external table of the calvarium presented a large amount of smaller and larger cavities which were slate colored and thick. The internal table of the skull showed the same appearance as that of the external table. The calvarium had a wormy appearance. The occipital bone and the basilar portion of the sphenoid and the entire petrous portion of the left temporal bone were also involved

and presented the same changes as in the
bone was excessively soft and brittle and
and larger cavities which contained broker



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The frontal bone was likewise involved. The pe
the right temporal bone and the middle fossa ai
fossæ were free from pathological changes.
column was not affected. The ribs were fragil
little marrow. The dura was not adherent; there
amount of pial fluid and the cerebral veins we
tended. The fluid at the base was slightly turbid a
amount. The vessels at the base showed no pathol
The left temporo-sphenoidal lobe was slightly a

middle fossa of the skull and to the dura. The longitudinal sinus and the sinuses on the left side of the head were free from thrombi. The pituitary body was covered by a whitish exudate.

The visceral organs showed some pathological changes, but not characteristic of a luetic process.

Bacteriological Examination.—Smears from the exudate of the cranial bones revealed no evidences of tuberculosis, syphilis or acute inflammatory process. No microörganisms were seen. A rabbit and guinea pig were inoculated: the former died and post-mortem examination showed thickening of the right testicle which was alone inoculated. The guinea pig is still living and shows no evidence of disease.

Microscopical Examination.—Sections from several portions of the calvarium, namely from the petrous, parietal, temporal, sella turcica and occipital bones, showed in the region of erosions formations of large amount of dense fibrous and connective tissue, covered on the surface with broken-down necrotic material which did not stain with hematoxylin or eosin. In the other parts there were areas which resembled gumma with a central caseous appearance surrounded by a wide area showing many small round cells, small blood vessels and numerous plasma cells. These gummatous areas lay here and there in dense scar tissue. No giant cells or spirochæta could be made out. The external surface of the dura showed necrotic material which was composed of fibrous and cell debris. The dura was thickened and revealed the presence of round cell infiltration, especially around the vessels. The pia and arachnoid showed injection of the vessels with edema and irregularly distributed connective tissue overgrowth. Sections from the cerebral cortex presented no evidences of perivascular infiltration. The ganglion cells showed degenerative changes in the protoplasm and the beginning of a hyaline thrombus in the smaller blood vessels was noted.

SUMMARY

If we take a critical survey of the clinical picture, we are confronted with the following important facts which are worthy of being emphasized: (1) The development of the disorder was gradual and insidious; at first the patient complained of pain in the legs and later she experienced intense headaches, boring in character, which in the beginning was not accompanied by nausea and vomiting. Only during the latter part of the disease, striking focal symptoms pointing to a cerebello-pontine involvement became manifest. (2) In spite of the intense and persistent headache and later vomiting, optic alterations were not in evidence. (3) Active anti-syphilitic treatment, including salvarsan, practically exerted no effect upon the clinical phenomena. (4) Occasional delirious excitement, which often bore direct relation to the intensity of the headache. (5) Finally, the presence of a positive Wassermann reaction in blood serum and practically negative findings of the cerebrospinal fluid.

Intra vitam, the clinical diagnosis was regarded as *cerebral neoplasm,* and by reason of definite localizing symptoms the site of growth was thought to be in the *cerebello-pontine angle.* The positive Wassermann reaction of the serum blood was looked upon as a transitory phenomenon which one not infrequently finds in *extreme exhaustive states.* Cerebral syphilis came under consideration, but the fact that the cerebrospinal fluid presented no pathological changes and moreover drastic anti-luetic measures for about three years had produced no appreciable influence upon the patient's condition, this diagnosis was excluded. It must be frankly admitted that syphilitic bone disease of the skull was unfortunately not thought of. Unfortunately Roentgenologistic examination which might have given us some clue as to the diagnosis could not be made because the patient was extremely weak during her stay in the hospital, and for the same reason, surgical interference was not resorted to.

The more we review the case retrospectively, the more we are impressed with the fact that there were definite symptoms which may be regarded as characteristic of syphilitic bone disease of the skull. The cases which have been reported in the literature present certain features which are common to all of them—namely, intense headache, boring in character, and accompanied by delirious episodes and relatively rapid course. In this connection it is important to note that in the clinical display there were two symptoms which were antagonistic to cerebello-pontine angle tumor, viz., absence of optic changes, despite apparent increase of intracranial pressure, and the late appearance of focal symptoms.

The localizing signs can be readily correlated with the pathological findings. The destruction of the petrous portion of the left temporal bone will explain the paralysis of the fifth, sixth and seventh and eighth nerves.

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Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

May 5, 6 and 7, 1913

Washington, D. C.

The President, Dr. Pearce Bailey, New York, called the meeting to order at 9: 50 A. M. and delivered his Presidential Address, entitled "The Development of Human Character."

Dr. Edward D. Fisher, New York, read a paper with the title: "Present Status of Neosalvarsan in the Treatment of Parasyphilis of the Nervous System."

Dr. Joseph Collins, New York, said he found himself in accord with Dr. Fisher in regard to the necessity of dispensing with the terms parasyphilis and metasyphilis. He did not think we needed to be told why those terms should no longer be used. In the treatment of disease of the nervous system flowing from syphilis the essential thing to keep in mind is that we are dealing with syphilis, that we are not dealing with nervous disease alone, but with a disease that requires more skill and persistence to circumvent it than almost any other disease. We are not going to make great headway until that conception becomes firmly rooted in us. When the internist meets with syphilitic disease of the liver or when the dermatologist meets with a syphilitic ulceration he does not conceive of himself treating a disease of the liver or of the skin, alone, he conceives himself treating the disease syphilis, and until we take that point of view we are not going to make great headway in the treatment of syphilitic disease of the nervous system. Dr. Collins said he was perhaps not able to follow Dr. Fisher's paper entirely. He understood Dr. Fisher to say that syphilis is a germ disease. Dr. Collins's conception is that syphilis is a protozoal disease, and, second, he understood him to say that the spirochetes were to be found in the cerebrospinal fluid. Dr. Collins said he supposed they had not been found in the cerebrospinal fluid. He was convinced of the fact that somatic evidences of syphilis do not disappear. If Dr. Fisher would demonstrate one case in which Argyll-Robertson pupil has disappeared under any treatment, he would like to see it. Dr. Collins protested against Dr. Fisher's statement in support of or against the value of salvarsan therapy, as to the non-necessity of presenting statistics, because he thought the necessity of presenting statistics was very great. If anyone would estimate the value of salvarsan in the treatment of syphilis, whether of the visceral or nervous system, he must in order to convince Dr. Collins present a detailed account of the clinical features of the cases treated and cite histological findings of the cerebrospinal fluid. Dr. Collins's experience with salvarsan and neosalvarsan covers 100 cases of tabes, 48 cases of paresis, about 36 or 37 cases of cerebrospinal syphilis, one that might be considered a fairly large experience—and still he cannot say what is the adequate treatment of syphilitic nervous diseases by neosalvarsan. In some they had 20 injections followed by 30 to 60 mercurial injections or inunctions. In other cases only three or four. Another word in regard to Dr. Fisher's address, Dr. Collins did not know the case of general paresis that he referred to, but if it was the case in which Dr. Fordyce gave 27 doses of neosalvarsan and 58 of mercury, many of them 2 to 3 grains of the salicylate, then Dr. Collins maintained that that case had been removed from the category of general paresis in which an intermission of symptoms occurs. That man, as Dr. Fordyce stated, had been at his work in the banking business for two years. Then he had gone beyond the period when we could explain the remission. Finally neosalvarsan does not come up to the measure which its originator set for it is the statement of the reader of the paper. The measure which the originator set was that it produced major sterilization. In the opinion of such syphilologists in this country, whose word and work has been worthy of great attention, as Dr. Fordyce, neosalvarsan does kill the spirochete within the first three months after the infection with the chancre. That the spirochetes which get entrenched in the nervous system three, four, ten or twenty years after infection are not killed by it is no indication that salvarsan has not fulfilled its promise. Major sterilization of the spirochete in some instances cannot be accomplished at that period.

Dr. Smith Ely Jelliffe, New York, said that he took it that Dr. Fisher was making no distinction between salvarsan and neosalvarsan, so that the discussion was pertinent to the general question of the treatment of parasyphilitic diseases by the newer arsenical remedies. Dr. Jelliffe felt, also, that there was justification in putting aside the term parasyphilis, or metasyphilis, if by retaining the terms, the idea that they were non-syphilitic diseases should be involved, but if such connotation were not implied, meta- and parasyphilis being distinctly recognized as syphilitic diseases per se, then he thought it might be desirable to still retain the term, meaning by it a slightly variant pathology. We would thus come to regard parasyphilis of the brain, i. e., paresis, as distinctly a parenchymatous type of destruction. That it varies from other types of cerebrospinal syphilis in its quantitative cellular reactions and in a particular trend of productive inflammation. It thus comes to be separable from cerebral syphilis only from the standpoint of the type of localization of the syphilitic reaction. The differences are quantitative rather than qualitative. Further realizing this quantitative variation the question why the cellular degeneration takes place as it does becomes one to be solved and hence affords a special point of attack for treatment whether by the newer arsenical remedies or not. Dr. Jelliffe thought that the recent pathological researches concerning paresis had brought two pertinent facts into the arena of discussion: The first was the presence of the organism and its being found where expert students of the pathology of the nervous system had least expected it to be. Instead of being in the pial infiltrations, the walls of the blood vessels, the blood spaces and in the lymph spaces, the *Treponema pallidum* had been found far removed from the blood vessels and lymph spaces. It was, in other words, inaccessible. Furthermore, another very important factor would seem to be that in the paretic brain one finds a blocking of the lymph spaces. The studies of Achucarro and Snessareuf have shown this conclusively. Therefore the lymph circulation is cut off in the paretic brain. A double difficulty, therefore, presents itself. On the one hand there is an inability for the ordinary lymphatic circulation to take place, and, on the other, there is an inaccessibility to the lymph stream to remedial agents. Those members of this Association who heard Dr. Camp's paper last year detailing the non-finding of arsenic or salvarsan in the cerebrospinal fluid after administration realized that within these observations there lay a certain question regarding the penetration of nervous tissues to salvarsan. If as has just been stated the lymph spaces are blocked in the paretic brain, then the problem narrows down to how we can get the salvarsan into contact with the spirochete. This is the first requisite for a successful therapy for paresis. Ergo, how to get the neosalvarsan into the nervous system, to kill the spirochete in view of the peculiar pathology of the disease. As to the observation made by Dr. Collins as to the non-finding of the spirochete in the cerebrospinal fluid, it might be said that the organism has been found there in five or six cases up to the present date, and here in Washington Dr. Nichols and Dr. Hough have cultivated it from the spinal cord of a patient with cerebrospinal syphilis and they are now running strains of it in the testicles of rabbits. The situation as Swift and Ellis have seemed to evolve it, namely by injection within the cerebrosinal fluid itself, seems to offer great hope. They inject directly into the cerebrospinal fluid the serum from patients under treatment. If this is not going to be of service in getting at syphilis of the nervous tissues then other and more efficient methods have to be devised. The criteria as to benefit from treatment are not the clinical observations, they must rest on the sero-biological findings. The patient must not only show the clinical signs of the disorder, mental and somatic, but must also present the added sero-biological signs. If after treatment one finds that the positive Wassermann disappears in the cerebrospinal fluid and globulin and cells are reduced to their respective norms, then we have positive proof that something has been done in paresis, independent of what the clinical signs may show. In his own experience when the sero-biological findings have shown these good results, as they have in some twenty or more patients under treatment, the clinical signs have shown corresponding improvement.

Dr. William M. Leszynsky, of New York, said that the post-mortem finding of dead spirochetes in the central nervous system will not help us very much either in the diagnosis or treatment of cerebrospinal syphilis. He thought we were hardly ready to radically change our nomenclature on this account.

Dr. Philip Coombs Knapp, Boston, said he was a little surprised at the statement or implication that, when we speak of para- or meta-syphilis, we are not dealing with syphilis itself. Even before the discovery of the spirochete, or the Wassermann reaction, he had not questioned the existence of the initial lesion of syphilis in tabes or paresis, but simply when it occurred and in fact that was often his formula of approach to the patient. Often this would lead to an admission by the patient of the existence of an initial lesion, when he had just denied it before to someone else. As Dr. Leszynsky had just said, it does not seem that the discovery of the spirochete in the brain of a paretic has been demonstrated to occur so constantly in every case of paresis and tabes as to prove that both are syphilitic instead of parasyphilitic. Certainly the clinical and pathological distinction thus far justify the division into ordinary syphilis and parasyphilis and this is a convenient distinction which might still be held. In regard to the use of neosalvarsan and salvarsan, his own experience has been that there is a good deal still in Ehrlich's original claim that in syphilis of the nervous system the results are not so likely to be beneficial as in the early stages of syphilis manifesting itself in other organs of the body. His experience both with neosalvarsan and salvarsan in syphilis of the nervous system has not, on the whole, led him to believe that the results were so much better than we have sometimes from the use of mercury and iodine. In the last two months he has been trying the intradural method to which Dr. Jelliffe referred but thus far the benefits of the intradural method seemed to him to be uncertain and possibly not of sufficiently greater value to justify the increase of danger in the use of that method.

Dr. Joseph Collins, New York, asked Dr. Knapp upon how many cases he predicated his present position. How many cases he had treated before he expressed himself. How much salvarsan has he had to give in any one case, controlled by a study of the Wassermann, the cells and the globulin, in order to bring this message to the Society and ask us to accept it with the weight of authority.

Dr. Philip Coombs Knapp, Boston, said those were questions he could not answer exactly or definitely. The cases varied and he had not tabulated them so that he could give his results. Some of his observations had extended over a period of two or three years. The number of injections has varied very much, naturally, some patients having had only one or two and others a considerable number. Controls were practised where possible.

Dr. E. D. Fisher, New York, said he agreed with Dr. Collins in regard to the value of statistics; it had not been his object in his paper to present them. The discovery of living spirochetes in the brain and spinal fluid, establishing the fact of an active agent being present in parasyphilis, made it imperative to use antisyphilitic remedies until a negative Wassermann reaction was present.

(*To be continued*)

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

OF VIENNA

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(Continued from p. 539)

Other versions of the saga of the Knight with the Swan have retained this original arrangement of the motives, although they appear commingled with elements of fairy tales. The saga of the Knight with the Swan, as related in the Flemish People's Book (Deutsche Sagen, I, 29), contains in the beginning the history of the birth of seven children,[59] borne by Beatrix, the wife of King Oriant of Flanders. The wicked mother of the absent king, Matabruna, orders that the children be killed, and the queen be given seven puppy dogs in their stead. But the servant contents himself with the exposure of the children, who are found by a hermit, named Helias, and are nourished by a goat until they are grown. Beatrix is thrown into a dungeon. Later on Matabruna learns that the children have been saved and her repeated command to kill them causes the hunter, who has been charged with the murder, to bring her as a sign of apparent obedience to her behest, the silver neck chains which the children wore already at the time of their birth. One of the boys, named Helias, after his foster father, alone keeps his chain, and is thereby saved from the fate of his brothers, who are transformed into swans, as soon as their chains are removed. Matabruna volunteers to prove the relations of the queen with the dog, and upon her instigation, Beatrix is to be killed, unless a champion arises to defend her. In her need, she prays to God, who sends her son Helias as a rescuer. The brothers are also saved by means of the other chains, except one, whose chain has already been melted down. King Oriant now transfers the rulership to his son Helias, who causes the wicked Matabruna to be burned. One day, Helias sees his brother, the swan, drawing a skiff on the lake surrounding the castle. This he regards as a heavenly sign, he arms himself and mounts the skiff. The swan takes him through rivers and lakes to the place where God has ordained him to go. Next follows the liberation of an innocently accused duchess, in analogy with the Lohengrin saga; and his marriage to her daughter Clarissa, who is forbidden to ask for her husband's ancestry. In the seventh year of their marriage she disobeys and puts the question, after which Helias returns home in the swan's skiff. Finally, his lost brother swan is likewise released.

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[59] The ancient Longobard tale of the exposure of King Lamissio, related by Paulus Diaconus (L, 15), gives a similar incident. A public woman had thrown her seven new-born infants into a fish pond. King Agelmund passed by, and looked curiously at the children, turning them around with his spear. But when one of the children took hold of the spear, the king considered this as of good augury; he ordered this boy to be taken out of the pond, and to be given to a wet nurse. As he had taken him from the pond, which in his language is called "lama," he named the boy Lamissio. He grew up into a stalwart champion, and after Agelmund's death, became king of the Longobards.

The characteristic features of the Lohengrin saga,—that the divine hero disappears again in the same mysterious fashion in which he has arrived; also the transference of mythical motives from the life of the older hero, bearing the same name, to a younger one, a very universal process in myth-formation, are likewise embodied in the Anglian-Longobard saga of Scëaf, which is mentioned in the introduction to the Beowulf-Song, the oldest German epic, preserved in the Anglo-Saxon tongue (translated by H. v. Wolzogen, Reclam). The father of old Beowulf received his name, Scild Scéfing (meaning the son of Scëaf), because as a very young boy, he was cast ashore as a stranger, asleep in a boat on a sheaf of grain (Anglo-saxon, scéaf). The waves of the sea carried him to the coast of the country which he was destined to defend. The inhabitants welcomed him as a miracle, raised him, and later on made him their king, as an emissary of God. (Compare Grimm, German Mythology, I, p. 306; III, p. 391, and H. Leo: Beowulf, Halle, 1839.) What is told of the royal house Scaf,[60] or Scëaf, appears in the Beowulf song, transferred to his son, Scëafnig Scild, according to the unanimous statement of Grimm (see above), and Leo (p. 24), his dead body is exposed at his behest, surrounded by kingly splendor. upon a ship without a crew, which is sent out into the sea. Thus he vanishes in the same mysterious manner in which his father arrived ashore; this trait being accounted for, in analogy with the Lohengrin saga, by the mythical identity of father and son.

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[60] Scaf is the high German "Schaffing" (barrel), which leads Leo to assume, in connection with Scild's being called Scefing, that he had no father Sceaf or Schaf at all, but was himself the boy cast ashore by the waves, who was named the "son of the barrel" (Schaffing). The name

A cursory review of these variegated hero myths forcibly brings out a series of uniformly common features, with a typical ground work, from which a standard saga, as it were, may be constructed. This schedule corresponds approximately to the ideal human skeleton which is constantly seen, with minor deviations, on transillumination of figures which outwardly differ from one another. The individual traits of the several myths, and especially apparently crude variations from the prototype, can only be entirely elucidated by the myth-interpretations. The standard saga itself may be formulated according to the following scheme:

The hero is the child of most distinguished parents; usually the son of a king. His origin is preceded by difficulties, such as continence, or prolonged barrenness, or secret intercourse of the parents, due to external prohibition or obstacles. During the pregnancy, or antedating the same, there is a prophecy, in form of a dream or oracle, cautioning against his birth, and usually threatening danger to the father, or his representative. As a rule, he is surrendered to the water, in a box. He is then saved by animals, or by lonely people (shepherds) and is suckled by a female animal, or by a humble woman. After he has grown up, he finds his distinguished parents, in a highly versatile fashion; takes his revenge on his father, on the one hand, is acknowledged on the other, and finally achieves rank and honors.[59]

The normal relations of the hero towards his father and his mother regularly appearing impaired in all these myths, as shown by the schedule, there is reason to assume that something in the nature of the hero must account for such a disturbance, and

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Beowulf itself, explained by Grimm as Bienen-wolf (bee-wolf), seems to mean originally (according to Wolzogen) Bärwelf, namely jungbar (bear cub or whelp), which is suggestive of the saga of the origin of the Guelphs (Ursprung der Welfen, Grimm, II, 233), where the boys are to be thrown into the water as "whelps."

[59] The possibility of further specification of separate items of this schedule will be seen from the compilations as given by H. Lessmann, at the conclusion of his work on "The Kyros Saga in Europe."

motives of this kind are not very difficult to discover. It is readily understood—and may be noted in the modern epigones of the heroic age—that for the hero who is exposed to envy, jealousy and calumny to a much higher degree than all others, the descent from his parents often becomes the source of the greatest distress and embarrassment. The old saying that " A prophet is not without honor save in his own country and in his father's house," has no other meaning but this, that he whose parents, brothers and sisters, or playmates, are known to us, is not so readily conceded to be a prophet (Gospel of St. Mark, VI, 4). There seems to be a certain necessity for the prophet to deny his parents; also, the well-known opera of Meyerbeer is based upon the avowal that the prophetic hero is allowed, in favor of his mission, to abandon and repudiate his tenderly beloved mother.

A number of difficulties arise, however, as we proceed to a deeper enquiry into the motives which oblige the hero to sever his family relations. Numerous investigators have emphasized that the understanding of myth formation requires our going back to their ultimate source, namely the individual faculty of imagination.[60] The fact has also been pointed out that this imaginative faculty is found in its active and unchecked exuberance only in childhood. Therefore, the imaginative life of the child should first be studied, in order to facilitate the understanding of the far more complex and also more handicapped mythical and artistic imagination in general.

Meanwhile the investigation of the juvenile faculty of imagination has hardly commenced, instead of being sufficiently advanced to permit the utilization of the findings for the explanation of the more complicated psychic activities. The reason for this imperfect understanding of the psychic life of the child is referable to the lack of a suitable instrument, as well as of a reliable avenue, leading into the intricacies of his very delicate and rather inaccessible domain. These juvenile emotions can by no means be studied in the normal human adult, and it may actually be charged, in view of certain psychic disturbances, that the normal psychic integrity of normal subjects consists precisely in their having overcome and forgotten their childish vagaries and imaginations: so that the way has become blocked. In children, on the other hand, empirical observation (which as a rule must remain merely superficial) fails in the investigation of psychic processes, because we are not as yet enabled to trace all manifestations correctly to their motive forces: so that we are lacking the instrument. There is a certain class of persons, the so-called psychoneurotics, shown by the teachings of Freud to have remained children, in a sense, although otherwise appearing grown up. These psychoneurotics may be said not to have given up their juvenile psychic life, which on the contrary, in the course of maturity, has become strengthened and fixed, instead of modified. In psychoneurotics, the emotions of the child are preserved and exaggerated, thus becoming capable of pathological effects, in which these humble emotions appear broadened and enormously magnified. The fancies of neurotics are, as it were, the uniformly exaggerated reproductions of the childish imaginings. This would point the way to a solution of the problem. Unfortunately, however, the access is still much more difficult to establish in these cases than to the child mind. There is only one known instrument which makes this road practicable, namely the psychoanalytic method, which has been developed through the work of Freud. Constant handling of this instrument will clear the observer's vision to such a degree that he will be enabled to discover the identical motive forces only delicately shaded manifestations, also in the psychic life of those who do not become neurotics later on.

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[60] See also Wundt, who psychologically interprets the hero as a projection of human desires and aspirations.

Professor Freud had the amiability to place at the author's disposal his highly appreciated experience with the psychology of the neuroses; and on this material are based the following comments, on the imaginative faculty of the child as well as the neurotic.

The detachment of the growing individual from the authority of the parents is one of the most necessary, but also one of the most painful achievements of evolution. It is absolutely necessary for this detachment to take place, and it may be assumed that all normal grown individuals have accomplished it to a certain extent. Social progress is essentially based upon this opposition between the two generations. On the other hand, there exists a class of neurotics whose condition indicates that they have failed to solve this very problem. For the young child, the parents are in the first place the sole authority, and the source of all faith. To resemble them, *i. e.,* the progenitor of the same sex; to grow up like father or mother, this is the most intense and portentous wish of the child's early years. Progressive intellectual development naturally brings it about that the child naturally becomes acquainted with the category to which the parents belong. Other parents become known to the child, who compares these with his own, and thereby becomes justified in doubting the incomparability and uniqueness with which he had invested them. Trifling occurrences in the life of the child, which induce a mood of dissatisfaction, lead up to a criticism of the parents, and the gathering conviction that other parents are preferable in certain ways, is utilized for this attitude of the child towards the parents. From the psychology of the neuroses, we have learned that very intense emotions of sexual rivalry are also involved in this connection. The causative factor evidently is the feeling of being neglected. Opportunities arise only too frequently when the child is neglected, or at least feels himself neglected, when he misses the entire love of the parents, or at least regrets having to share the same with the other children of the family. The feeling that one's own inclinations are not entirely reciprocated seeks its relief in the idea,—often consciously remembered from very early years,—of being a stepchild, or an adopted child. Many persons who have not become neurotics, very frequently remember occasions of this kind, when the hostile behavior of the parents was interpreted and reciprocated by them in this fashion, usually under the the influence of story books. The influence of sex is already evident, in so far as the boy shows a far greater tendency to harbor hostile feelings against his father than his mother, with a much stronger inclination to emancipate himself from the father than from the mother. The imaginative faculty of girls is possibly much less active in this respect. These consciously remembered psychic emotions of the years of childhood supply the factor which permits the interpretation of the myth. What is not often consciously remembered, but can almost invariably be demonstrated through psychoanalysis, is the next stage in the development of this incipient alienation from the parents, which may be designated by the term *Family Romance of Neurotics.* The essence of neurosis, and of all higher mental qualifications, comprises a special activity of the imagination which is primarily manifested in the play of the child, and which from about the period preceding puberty takes hold of the theme of the family relations. A characteristic example of this special imaginative faculty is represented by the familiar *day dreams,*[61] which are continued until long after puberty. Accurate observation of these day dreams shows that they serve for the fulfilment of wishes, for the righting of life, and that they have two essential objects, one erotic, the other of an ambitious nature (usually with the erotic factor concealed therein). About the time in question the child's imagination is engaged upon the task of getting rid of the parents, who are now despised and are as a rule to be supplanted by others of a higher social rank. The child utilizes an accidental coincidence of actual happenings (meetings with the lord of the manor, or the proprietor of the estate, in the country; with the reigning prince, in the city. In the United States with some great statesman, millionaire). Accidental occurrences of this kind arouse the child's envy, and this finds its expression in fancy fabrics which replace the two parents by others of a higher rank. The technical elaboration of these two imaginings, which of course by this time have become conscious, depends upon the child's adroitness, and also upon the material at his disposal. It likewise enters into consideration, if these fancies are elaborated with more or less claim to plausibility. This stage is reached at a time when the child is still lacking all knowledge of the sexual conditions of descent. With the added knowledge of the manifold sexual relations of father and mother; with the child's realization of the fact that the father is always uncertain, whereas the mother is very certain—the family romance undergoes a peculiar restriction; it is satisfied with ennobling the father, while the descent from the mother is no longer questioned, but accepted as an unalterable fact. This second (or sexual) stage of the family romance is moreover supported by another motive, which did not exist in the first (or asexual) stage. Knowledge of sexual matters gives rise to the tendency of picturing erotic situations and relations, impelled by the pleasurable emotion of placing the mother, or the subject of the greatest sexual curiosity, in the situation of secret unfaithfulness and clandestine love affairs.

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[61] Compare Freud, "Hysterical Fancies, and their Relation to Bisexuality," with references to the literature on this subject. This contribution is contained in the second series of the "Collection of Short Articles on the Neurosis Doctrine," Vienna and Leipsic, 1909.

In this way the primary or asexual fantasies are raised to the standard of the unproved later understanding.

The motive of revenge and retaliation, which was originally to the front, is again evident. These neurotic children are mostly those who were punished by the parents, to break them of bad sexual habits, and they take their revenge upon their parents by their imaginings. The younger children of a family are particularly inclined to deprive their predecessors of their advantage by fables of this kind (exactly as in the intrigues of history). Frequently they do not hesitate in crediting the mother with as many love affairs as there are rivals. An interesting variation of this family romance restores the legitimacy of the plotting hero himself, while the other children are disposed of in this way as illegitimate. The family romance may be governed besides by a special interest, all sorts of inclinations being met by its adaptability and variegated character. The little romancer gets rid in this fashion for example of the kinship of a sister, who may have attracted him sexually.

(To be continued.)

Periscope

Archiv fur Psychiatrie und Nervenkrankheiten

(50. Band. 1. Heft)

1. Psychiatric-neurological Contribution on Sleeping Sickness. W. VIX.
2. Pathology and Pathogenesis of Primary Chronic Hydrocephalus. M. S. MARGULIS.
3. Treatment of Progressive Paralysis. WALTHER SPIELMEYER.
4. Treatment of General Paralysis. E. MEYER.
5. Acquired Mental Disturbances in the Army. MÖNKEMÖLLER.
6. Progressive Paralysis Combined with Marginal Meningeal Myelitis. E. MEYER.
7. Suicide. WASSERMEYER.
8. Psychopathology of Paralysis Agitans. H. KÖNIG.
9. Polyneuritic Psychoses following Artificial Abortion. R. HAHN.

1. *Sleeping Sickness.*—Vix writes of his experience in Kigarama and Usumbura, in German East Africa, in connection with sleeping sickness endemic in those regions. A large number of cases were investigated from the neurological and psychiatric standpoint, and autopsy material for later work preserved. About seventy cases were studied in this manner. Certain cases are reported in detail, with clinical and pathological findings. In a large proportion of the cases, trypanosomes were found in the blood or cerebrospinal fluid. A detailed account of the pathological findings is given, with the general result that the disease is found to be characterized by an inflammatory process, with marked infiltration about the vessels. The process is very much more acute than, for example, that found in dementia paralytica; and no special difficulty exists in differentiating it from arteriosclerosis and endarteritis of varying etiology. The writer expresses the belief that a painstaking neurologic and psychiatric study of the condition might throw light upon the problem in such a way as to lead to a more practical combating of the disease.

2. *Primary Hydrocephalus.*—On the basis of a careful study of the literature and personal cases, Margulis reaches twenty-one general conclusions, the more important of which are, that the anatomical picture of internal hydrocephalus consists in changes in the vessels of the choroid plexus, of the ventrical walls, and of the pia; that the anatomical basis is a chronic periependyma glio-fibrosis; that all cases of primary chronic hydrocephalus are acquired; that primary hydrocephalus and syringomyelia are precisely the same process occurring in different localities.

3. *Paresis.*—Spielmeyer discusses at length the treatment of general paralysis on the basis of recent knowledge regarding its etiology and relation to syphilitic processes in general, with a comparison of the conditions found in sleeping sickness. The paper is too technical in character to permit of adequate brief summary.

4. *Paresis.*—Meyer also writes on the treatment of general paralysis, particularly with reference to the use of salvarsan, and the behavior of

the spinal fluid under its administration. In his experience, about half the cases demonstrated favorable results as indicated by the Wassermann reaction and the general findings in the cerebrospinal fluid. The general conclusion is reached that, although a certain step in the treatment of general paralysis has been obtained by recent discoveries, it must still be admitted that we are far from an adequate treatment of the disease. The main problem remains one of prophylaxis, which may in a measure be secured through a careful and repeated study of the serum and spinal fluid in persons who have been the victims of syphilis. By such means, it may be possible to protect in a measure such persons from later paralysis.

5. *Military Psychiatry.*—Mönkemöller discusses, on the basis of a large clinical material, the various mental disturbances likely to occur among soldiers, due to the special circumstances of their lives. The article concerns itself also with practical details of the proper treatment of soldiers with mental disease, and insists upon the necessity of realizing the significance of the psychoses in the army to the end that such disturbances may be more satisfactorily met and avoided.

6. *Paresis Myelitis.*—Meyer offers a contribution on the differential diagnosis between general paralysis and cerebrospinal syphilis on the basis of a case carefully studied, both clinically and pathologically. It serves as a contribution to the difficult and important question as to the true syphilitic nature of general paralysis.

7. *Suicide.*—Wassermeyer has made an exhaustive investigation as to the methods of suicide and the mental states which lead to it. It is found that suicide is four times as frequent among men as among women, which is possibly explainable on the basis that men accomplish their end more successfully than women. Statistics show that hereditary taint occurred in 43 per cent. of insane men and 65 per cent. of insane women who committed suicide. Alcoholism was demonstrated in 50 per cent.; in 30 per cent., the patients were imbecile and hysterical men. In 22 per cent. of insane men, 17 per cent. of insane women, and 9 per cent. of alcoholics, suicide in the immediate family had occurred. So far as statistics are valuable, this piece of work throws considerable light on a difficult social question.

8. *Paralysis Agitans.*—König has studied the mental disturbances in paralysis agitans at Professor Siemerling's clinic in Kiel. Since the year 1901, 23 cases of paralysis agitans had been under observation among about five thousand cases of various sorts of nervous disease. Among these, 12 were men and 11 women, which—as do Mendel's statistics—indicates that the disease is equally frequent in the two sexes. In the original description of the disease written by Parkinson no mention was made of mental disturbance, and in general it is not to be regarded as a constituent part of the clinical picture. Through careful study of the mental states of these patients, the writer was however able to find a considerable amount of mental disturbance, varying from a hypochondriacal to a melancholic or paranoid condition. How far certain of these conditions may be due to the mere existence of a distressing and fatal disease is a matter of importance. König concludes that in many cases an abnormal mental attitude, usually characterized by hypochondriacal depression or rarely by euphoria, is present. In certain cases, this mental attitude increases to a true psychosis. A frequent combination is a senile dementia or a terminal delirium.

9. *Korsakow's Disease.*—Hahn contributes a brief article on the basis

of a single case relative to the question of the occurrence of the so-called polyneuritic psychoses in connection with artificial abortion. The matter is of general interest on account of the question of infection and the nature of that infection. In the case under discussion, Hahn believes that a polyneuritic psychosis stood in direct relation with the pregnancy. Alcohol was excluded as a cause, nor was there evidence of other poison or infectious disease. The clinical picture was precisely that of an alcoholic Korsakow psychosis which, fully developed, followed an artificial abortion accompanied by persistent vomiting.

E. W. TAYLOR (Boston).

Journal of Mental Science

(Vol. 55, No. 230. July)

1. The Clinical Value of Consciousness in Disease. T. CLAYE SHAW.
2. The Urgent Necessity of Helping Mental Convalescents. ROBERT JONES.
3. Observation on the Blood Pressure and Vascular Disease in the Female Insane. JOHN TURNER.
4. On the Wassermann Reaction and Especially its Significance in Relation to General Paralysis. CARL HAMILTON BROWNING AND IVY MCKENZIE.
5. A Bacteriological Investigation into General Paralysis of the Insane and a Table of Blood Counts. DAVID THOMSON.
6. Remarks on Hospital (*i. e.* Asylum) Treatment of the Acutely Insane. MERVYN A. ARCHDALE.
7. The Clinical and Post Mortem Aspects of Status Lymphaticus. R. ERNEST HUMPHRY.
8. The Housing of the Insane in Victoria with Special Reference to Licensed Houses and Borderline Cases. W. BEATTIE SMITH.
9. Receiving Houses. W. ERNEST JONES.
10. Insane Movements and Obsession. J. LOUGHEED BASKIN.
11. Some Suggestions as Regards the Origin of Modern Psychiatric Ideas Together with a Note of Some Cases of Mania Apparently Due to Microbic Infection. R. R. LEEPER.

1. *Clinical Value of Consciousness in Disease.*—The writer compares the consciousness of insane states with that of dream states, and finds that in both there is usually a disassociation between the ideal and the motor processes. It is therefore hard at times to guess the amount of memory and consciousness remaining in any given case. "In many (if not in most) attacks of acute insanity the patient on recovery has no recollection of the incidents of the illness." This is because there have been two states of consciousness, a dual condition. The question of the degree of consciousness in insanity is most important from a medico-legal standpoint, the responsibility of the patient.

2. *Helping Mental Convalescents.*—This paper presents the necessity for after-care work among the insane and was read at an anual meeting of the After-Care Association which in 1909 had been in existence and active usefulness for thirty years.

3. *Blood Pressure and Vascular Disease.*—Some of the author's conclusions are as follows. (1) There is no definite relation between blood

pressure and exalted or depressed emotional states, but the very general occurrence of higher pressures with the first few readings on consecutive days in any individual case suggests that there is some nervous condition at work which has the effect of interfering with the pressure. (2) Advancing age is accompanied by a rise in blood pressure. (3) Only a rough estimate of blood vessel change can be made by pressure observations alone. (4) There is a slight tendency for the higher blood pressure to be associated with the slower blood coagulation.

4. *On the Wassermann Reaction.*—The reaction does not become apparent until some time after the appearance of the primary sore. In the secondary or acute stage it is usually present. In the latent period, present in 50 per cent. In the tertiary and advanced parasyphilitic conditions it is usually present. There is great similarity between general paralysis and trypanosome fever or sleeping sickness and the anatomical course of trypanosomiasis is similar to that of syphilis. The failure to demonstrate the organism of syphilis in general paralysis constitutes the missing link in the chain of comparison.

It is pointed out that the independence of syphilitic and parasyphilitic infections has not yet been established and a further search for spirochetes in general paralytics is necessary. A line of treatment might be adopted on the supposition that general paralysis is the manifestation of an active and progressive process.

5. *Bacteriology and Blood Counts in General Paralysis.*—This investigation was undertaken primarily to ascertain whether or not the *Bacillus paralyticans* described by Ford Robertson was the cause of general paralysis. Blood before and after death and various organs after death were examined and cultures made. Organisms were more often found in general paralytics than in other classes of insane (used as controls) but no definite conclusions could be drawn. Thirty blood counts of twenty-six cases of general paralysis showed a higher average number of leucocytes than is found in the blood of healthy individuals.

6. *Treatment of Acute Psychoses.*—After the writer has discussed the etiological factors of insanity under the heads (1) low resistance, (2) physical injury, (3) strain, (4) deficient nourishment, (5) chemical injury, valuable suggestions are made as to treatment. Confinement to bed in fresh air is advocated, many of the necessary details being given. Psychic treatment and suggestion therapeutics especially for the psychoneuroses, dietetics, proper regulation of the bowels, water drinking and saline injections to aid excretion of toxins are all considered. The indications in regard to sepsis oral and otherwise and the use of sedatives and hypnotics are outlined. There is a stage in convalescence when rest treatment must be abandoned and exercise will hasten recovery.

7. *Aspects of the Status Lymphaticus.*—The author states that this condition is not one of great rarity as is generally believed but is frequently the cause of sudden and unaccountable death so often attributed to "heart failure." He has met with six cases in two and a half years. The clinical symptoms are not marked, but the post-mortem changes are characteristic. Among the findings regarded by the writer as typical are the enlarged thymus and hemolymph glands of the mesentery, prominent lymphatic nodules at the base of the tongue; also enlarged lymphatics of the interior of the stomach, colon and mesentery. The glands on section have a peculiar characteristic pink color. An abstract of one case with necropsy is appended.

8. *Housing of the Insane in Victoria.*—A discussion of the legal aspects of certification of the insane. Some changes in the laws are recommended, making it possible for early treatment of incipient cases without the regular procedure of certification, the latter to follow later if necessary.

9. *Receiving Houses.*—In this paper the receiving house at Melbourne is described and a plan of the same is given. A year's statistical tables are also included. The writer thinks that such institutions would materially reduce the number of insane and the cost of maintenance, especially if a convalescent home in the country were available where the recently recovered may gradually return to the responsibility of caring for themselves.

10. *Insane Movements and Obsessions.*—A description of a case which had peculiar stereotyped movements of the hands and arms, constantly repeated during the day. It seems most likely to have been a case of dementia præcox. The writer illustrated his paper by a cinematograph reproduction of the movements.

11. *Origin of Modern Psychiatric Ideas.*—This article in a semi-humorous and satirical strain traces back two centuries, the modern ideas such as occupation for the insane, treatment by organic extracts, bacterial and biochemical toxins as etiological factors, etc. The writer alludes to various passages in Swift's "Tale of a Tub." He also describes briefly two cases of mania which he regarded as of bacillary origin.

MISCELLANY

A Case of Cerebral Tuberculosis Clinically and Anatomically Cured. G. Fiore. (Revista di cl. Pediatrica, 1911, no. 11.)

This is an observation of a child of 5 who had for several months presented convulsive phenomena of cerebral tuberculosis. The convulsions were almost exclusively localized to the extensor muscles of the right hand. These observations were verified and controlled during a period of stay in the clinic extending over a period of 17 months, after the convulsions had ceased after seven months. At this time the patient died of a miliary tuberculosis. On autopsy, which showed miliary tubercles throughout the chest, a nodule was found in the left precentral convolution. Histological study showed that this tubercle had undergone complete fibrous resolution. There were remnants of a necrobiotic granuloma in which there were no bacilli, but infiltrated with calcium salts and surrounded by and invaginated by glia cells, shutting off the nodule from the surrounding normal nervous elements. The case is rare and the author calls attention to it because of the transitory nature of the syndrome of a cerebral tumor, verified after death, and its cause removed by the regression of the tubercle and its cure by a connective tissue cicatricial repair process. He expresses the belief that such reparative processes are more frequent than is generally believed.

Jelliffe.

Book Reviews

MENTAL DERANGEMENTS IN INDIA. By A. W. Overbeck Wright. Thacker Spinck & Co., Calcutta, 1912.

The chief interest of this little volume lies in those parts which deal specifically with psychiatry as it is peculiar to India. Aside from this one would hardly expect to find much that is new in a book on psychiatry by a follower of the British school.

The author adheres closely to Bruce's views on the causation of the psychoses, and in detailed discussion of the toxic origin of what are generally conceded to be functional psychoses, such phrases as "the leucocytosis of catatonic mania" receive an entirely undue and hardly justifiable emphasis.

According to the author 25 per cent. of the male insane in India owe their mental derangement to the abuse of cannabis indica in some form or other. Child marriages, which are common among the Hindus, is given as another very prevalent cause of insanity in India.

Although one would expect the clinical manifestations of the insane to be more or less similar in all countries, it appears that in India, states of excitement and elation predominate over depressive conditions. What is commonly known as the "running amuck" is one of the most frequent manifestations in the Indian insane. The author does not attempt to explain this, and it might not be out of place here to mention Kraepelin's views on this subject. Kraepelin's studies on the relation of the respective phases of "manic depressive" insanity to age have shown that the excited phases are more common in the young, while those of more advanced age are more apt to suffer from depressions. He believes this to be due to the fact that in the young there is a lack of a proper appreciation of the affairs of life, a tendency to take things lightly. As the individual grows older he assumes a more serious outlook on life, and is more apt to express his mental derangement in a depressive state. The work of Dreyfus on the relation of involution melancholia to manic depressive insanity would tend to substantiate this. Ontogeny recapitulates phylogeny, and what is true of the individual is true of the race. This is certainly the case in the Negro, in whom excitements are more common than depressions. May not this same law be at work among the Hindus of the Punjab?

Another interesting feature of the book is the description of a special form of microcephalic imbecility which seems to be endemic in the Punjab. The individuals so affected are known among the natives as "Sha Doula's mice," and present a distinct and more or less uniform type of mental defect.

The book also contains a brief summary of the Indian laws pertaining to the insane. The book will prove of value to those interested in comparative psychiatry.

BERNARD GLUECK, M.D.

DIE ERKENNUNG DER SCHWACHSINNS BEIM KINDER. Dr. Med. Emil Villiger. Wilhelm Engelmann, Leipsic.

The book contains a discussion of feeblemindedness in children and the author reproduces in detail the various intellectual tests (Binet, Simon's, Ziehen and others) which are employed in the examination of defective children. He gives considerable attention to the organic side of feeblemindedness; in general, however, the book contains no new ideas.

KARPAS.

THE MIND OF PRIMITIVE MAN. By Franz Boas. The Macmillan Company, New York.

This series of essays, which have been remodeled, affords an insight into some problems of much value to the student of medicine at all alive to social forces.

Speaking of racial prejudices, the author says that "several races have developed a civilization of a type similar to the one from which our own had its origin. A number of favorable conditions facilitated the rapid spread of this civilization in Europe. Among these, common physical appearance, contiguity of habitat, and moderate differences in modes of manufacture, were the most potent. When, later on, civilization began to spread over other continents, the races with which modern civilization came into contact were not equally favorably situated. Striking differences of racial types, the preceding isolation which caused devastating epidemics in the newly discovered countries, and the greater advance of civilization, made assimilation much more difficult. The rapid dissemination of Europeans over the whole world destroyed all promising beginnings which had arisen in various regions. Thus no race except that of eastern Asia was given a chance to develop an independent civilization. The spread of the European race cut short the growth of the existing independent germs without regard to the mental aptitude of the people among whom it was developing. On the other hand, we have seen that no great weight can be attributed to the earlier rise of civilization in the Old World, which is satisfactorily explained as a chance. In short, historical events appear to have been much more potent in leading races to civilization than their faculty, and it follows that achievements of races do not warrant us in assuming that one race is more highly gifted than the other." He further says: "Differences between the white race and other races must not be interpreted to mean superiority of the former, inferiority of the latter, unless this relation can be proved by anatomical or physiological considerations."

Boas believes that environment has great influence upon the development of races, and that anatomical data are not secure in postulating superiority or inferiority. He is apparently not acquainted, however, with the data of Campbell, Brodmann, Bolton, Kaes, Vogt and others relative to the histological structures of the human cortex, and in his chapter on mental traits rests with the studies of Tylor and Spencer.

In general the gap between primitive and civilized races is very slight after all in the author's general conception. Thus, p. 123, he says: "We are not inclined to consider the mental organization of different races of man as differing in fundamental points. Although, therefore, the distribution of faculty among the races of man is far from being known, we can say this much: the average faculty of the white race is found to the same degree in a large proportion of individuals of all the other races, and, although it is probable that some of these races may not produce as large a proportion of great men as our own race, there is no reason to suppose that they are unable to reach the level of civilization represented by the bulk of our own people."

With the author's general conclusion every one can agree: "That the data of anthropology teach us a greater tolerance of forms of civilization different from our own, and that we should learn to look upon foreign races with greater sympathy, and with the conviction, that, as all races have contributed in the past to cultural progress in one way or another, so they will be capable of advancing the interests of mankind, if we are only willing to give them a fair opportunity."

JELLIFFE.

DIAGNOSTIC UND PROGNOSTIC DER GEISTESKRANKHEITEN. Ein kurzes Lehrbuch von Dr. Manfred Fürhmann. Zweite, vermehrte und verbesserte Auflage. Verl. V. Johann Ambrosius Barth, Leipzig.

Führmann's new edition of the "Diagnosis and Prognosis of Mental Diseases" differs very little from the last one. This volume is divided into two parts—general and special; the former deals with general psychiatric matters, such as history-taking, observation and examination of patients, symptomology, etc., the latter includes special mental diseases which are presented in a dogmatic and objective manner. The Kraepelian classification is adopted.

In general this book is useful, especially the first part, to the beginner. It is lamentable that the author did not include in his book the various intellectual tests, Jung's association test and something about Freud's psychopathology. It is also important to note that lumbar punctures and the Wassermann test have been very superficially treated—he could only spare less than one half page to such an important subject.

KARPAS.

MIND AND HEALTH. With an Examination of some Forms of Divine Healing. By Edward E. Weaver, Ph.D., Fellow in Clark University. The Macmillan Co., New York.

An introductory statement, made by Dr. Stanley Hall concerning this somewhat diffuse work, serves to indicate the general scope.

Dr. Hall says: "The author of this book has devoted years of patient study to the various phenomena in these fields and has endeavored to give a rational and coherent explanation of them according to the principles of modern science. He has sought to maintain a sympathetic attitude towards all those who believe in the power of the mind over the body, and he seeks to show that those who discredit this, as certain medical writers are still prone to do, omit a fact of human nature of profound theoretical and practical significance. This critique, on the other hand, is no less searching and impartial as to those who maintain the sufficiency of purely psychic agencies to effect cures or to explain a large class of phenomena that illustrate relations between the mind and the body. It is thus the comprehensiveness of his studies and the attempted judiciousness of his point of view that in my opinion give this volume its own place and value and that will serve, I hope, to diffuse a more sane, wholesome and impartial viewpoint in this field. With many recent books, precisely this breadth and harmonizing tendency have generally been wanting. The writer sees the profound significance of the new psychoanalytic methods and results in their bearing upon the manifold and complex facts in his domain. One need not, and indeed perhaps no one would, entirely agree with all the conclusions of any author on all the topics treated here, but I see no reason why religion, which in past ages has always exerted such a profound influence upon all matters of health and disease, cannot rehabilitate for itself from the material herein described its own function of healing, which, when it is complete, will have profound significance on the future fate and function of the church."

UEBER DEN SELBSTMORD. Eine Pathologisch-anatomische und Gerichtlicht-medizinische Studie. Von Dr. Hermann Pfeiffer. Gustave Fischer, Jena.

Pfeiffer's contribution consists of a statistical study of suicide which is presented from pathologico-anatomical and medico-legal points of view. The material employed consists of 595 autopsies which were performed from 1898 to 1912. It is interesting to note that most of the suicides occurred in the months of February, June and October. There were 443 men and 152 women. The average age in both sexes at the time the act was committed was 30 years. The nature of the attempt was as follows: Strangulation 35 per cent.; shooting 34 per cent.; drowning and poisoning 12½ per cent.; and the mode of other atempts was still less frequent. In men strangulation and shooting were common; whereas women resorted to drowning and poisoning.

Pathological alterations were present in a very large majority of his cases. Out of 443 men 27 autopsy records were excluded because the cadavers had undergone considerable decomposition; and 12.25 per cent. gave negative findings. In some cases the nervous system was affected; circulatory apparatus showed some changes; and arteriosclerosis and chronic alcoholism were also in evidence. In women 12 cases were also eliminated for similar reasons and in 8 per cent. examination showed no pathological conditions. It is worthy of note that there were 32 pregnant women, 20 of whom employed certain drugs to induce abortion and the author is rather reluctant to regard them as true suicides. He emphasizes the fact that none of them revealed any pathological changes in any of the organs. It is also to be remembered that 33 per cent. of the women suffered from some gynecological affection; furthermore 75 per cent. of the women were physically sick and no doubt they could be placed in the group of the mentally affected. Of the pregnant women 8 displayed suspicious signs of a mental disease.

The author contends that the suicide is almost exclusively a sick person and comes to the conclusion that the individual who commits suicide is incapable of reasoning properly but in most instances the act is a reflex action which very seldom comes to a clear consciousness, hence he is incapable of viewing his situation in the light of reason. "In suicide we have almost always a predisposition towards an inadequate affective behavior."

KARPAS.

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Original Articles

FEAR AND ATAXIA

By William J. M. A. Maloney, M.D., Ch.B., F.R.S. Edin.,

ADJUNCT PROFESSOR OF DISEASES OF THE MIND AND NERVOUS SYSTEM, POST GRADUATE MEDICAL SCHOOL; ATTENDING NEUROLOGIST, NEUROLOGICAL HOSPITAL, NEW YORK

Movements are coördinate which are accomplished with appropriate muscular effort, harmonious rhythm, regular speed, exactness in direction and accuracy in extent. To subserve the coördination of movement a complex neuro-muscular mechanism exists. This coördinating mechanism is almost coëxtensive with the nervous system. It is thus widely exposed to injury. Lesions of any part of the mechanism may temporarily or permanently derange the function of coördination and induce a state of local or general incoördination or ataxia. Hence, ataxia or incoördination complicates many nervous diseases. The incoördinating effect of a lesion depends upon its site, extent, and rapidity of development. In the disease with which ataxia or incoördination is particularly identified in popular medicine, locomotor ataxia, the vestibular, cerebellar, spinal and peripheral components of the coördinating mechanism all may be affected. The main stress falls habitually upon the spinal and peripheral components.

The initial stage of locomotor ataxia or tabes dorsalis is distinguished essentially by the absence of ataxia. Evidence of profound structural change in the regions characteristically affected by locomotor ataxia may be present in this initial stage of outwardly perfect coördination.

Typically the onset of the ataxia is insidious; the patient notices he no longer feels the ground as before; his feet seem numb, it is as if he walked on felt; he negotiates stairs with increasing awkwardness; he has difficulty in walking in the dark; he falls into his washbasin if he closes his eyes when washing; or other indications of commencing uncertainty in movement alarm him. The condition gradually advances and manifestations at first intermittent become more nearly continuous until he can hardly take any action without some consciousness of uncertainty. Not rarely there occurs a sudden exacerbation, which the tabetic attributes to a definite incident, such as a chill, a fall, a fright, or overwork.

The ataxia may first appear in a limb where sensory loss is evident, and the increase of the ataxia may be roughly parallel to that of the sensory loss. But the severity of the ataxia does not always correspond with the severity of the sensory alterations; Frenkel and others allege that ataxia may occur without sensory loss; we may have sensory changes without ataxia (*e. g.,* in the preataxic stage). The preataxic differs from the subsequent ataxic stage only by that which the name implies, the absence of ataxia in the first and its presence in the second.

Increase of the lesions alone is often inadequate to explain the ataxia, for the ataxia sometimes begins and progresses without any apparent change having occurred in the organic lesions, and considerable sensory changes sometimes arise without any corresponding increase of incoördination.

After ataxia has developed, a return to the preataxic stage may be obtained by suitable exercise therapy. This desirable result has not been invariable nor even customary but it has been reported and I have observed several such successes. And although complete success is rare and only to be obtained in those whose ataxia either is not marked or is of recent appearance, a considerable improvement in the coördination almost inevitably results from adequate educational exercises. The exercises do not in any discernible way affect the existing structural change; they do not diminish lesions; indeed they may have no detectable objective influence other than the relief of the ataxia.

The ataxic stage may as the result of the occurrence of blindness retrogress and the preataxic stage be again established. In a recent paper in which incontrovertible cases of this complete retrogression were enumerated, and other evidence was given of the benign influence of blindness upon ataxia, I suggested the following law to define the relation of blindness to ataxia:—Of two tabetics one blind, the other seeing, at any stage of the disease, other things being equal, the blind is the more liable to persist coördinate, the less liable to become ataxic.

The ataxia varies in degree according to moods and emotions: it is greater in fatigue than in freshness, in despondency than in cheerfulness, in terror than in calm and in pain than in comfort. These oscillations in the ataxia last just as long as the mental state which causes them. As the fatigue or the despondency or the fear or the pain diminishes the ataxia decreases.

As ataxia may be absent in presence of tabetic structural changes; as an increase in the extent of these structural changes is not necessarily or invariably followed by an increase in the ataxia; as without evident alteration in the structural lesions ataxia may advance—as I shall presently show; or may retrogress owing to the influence of education or blindness; and as transient mental states without detectably affecting the structural changes may markedly influence the ataxia, the ataxia is not wholly dependent upon the tabetic structural changes. It is indubitably a consequence of the tabetic lesions but neither an invariable nor a constant nor an indispensable consequence. It is a consequence which to a certain extent is indirect, and to that extent probably avoidable and certainly remediable.

The function of coördination as it is habitually exercised is a reflex and an automatic function. We do not consciously determine the relaxation of the antagonists; or the order, the strength and the relative rate of the contractions in the several groups of muscles which may be involved in a single movement.

A reflex does not alter from moment to moment. Its constancy and infallibility are among its chief characteristics. Neither does the effectivity of a group of reflexes vary without cause. Hence, to explain the variations in ataxia which result from education, mood and blindness we must postulate the existence in our coördinating power of some other potential component besides the reflex structural mechanism which has been established by physiologists and which by some, such as Egger, is held to be the sole mechanism. The influence of this other component may vary from hour to hour according to the mood, environment, comfort, and physical state of the patient. This influence may be enhanced by educational exercises; and is greater in the blind than in the seeing.

The only influence which is capable of such variation, is subject to mood, to environmental and to physical conditions and is greater in the blind than in the seeing, and in the trained than in the untrained, is a psychic influence. The coördinating power must have a psychic component. The function of the automatic reflex coördinating mechanism must be capable of being enhanced or diminished by psychic power.

The value of any factor in a symptom is almost impossible to estimate unless the influence of that factor can be isolated. The onset of ataxia is usually too gradual to permit us to define the influence of the psychic component. I thought that by taking cases of atypical onset of ataxia and by ascertaining to which factor the atypical onset was due, I could more clearly establish the determinants of ataxia. The particular cases I shall discuss here are instances in which the ataxia began not insidiously as is its wont, but suddenly, at or very soon after the occurrence to which the ataxia was attributed. The ataxia in these cases began either violently or, if mildly, increased with unusual rapidity.

I have seen three cases in which tabetics unhesitatingly attributed their ataxia to a minor accident. Physicians to whose attention I have brought this subject have so frequently been able to furnish similar examples from their personal practice that I am certain this mode of onset of ataxia definitely exists.

These accidents were so slight that they could not possibly, under normal circumstances, have affected motor stability. No bones were broken. The greatest lesion of continuity was a skin abrasion. So the effect was altogether disproportionate to the physical injury, was altogether inexplicable as the result of the physical injury alone; was, indeed, greater than could be produced by any physical injury.

The minor accident was a slip on a greasy pavement, a fall down a few steps, a stumble over a small obstacle. I have under my care at present a gentleman who is suing a Traction Company because his ataxia began almost immediately after he fell down a subway stair. Such traumatic ataxia is common in the courts.

Not rarely the litigants and experts confound the onset of ataxia with the onset of the tabes.

The ataxia in the three appeared suddenly, at a definite ascertainable moment. This moment may be suspected in a case such as the patient who, at present, is suing the Traction Company. I have not been able to verify or to disprove his statement; but in the other cases I have got such corroborative evidence from relatives and friends as removed my doubt that ataxia did develop suddenly in these patients; that there was a moment which we may call the "*ataxic moment*" before which the movements were apparently normal and after which they were more or less chaotic, and incoördinate.

What was the relation of the accident to the ataxia? Ataxia we have already shown begins typically as a slight uncertainty of movement and increases by imperceptible stages. Here ataxia appeared synchronously with or immediately after the accident in each case. The ataxia not only appeared suddenly but in one case was of acute degree from the onset and in the others developed with fulminating rapidity. In the absence of any ascertainable cause except the accident we must attribute to the accident both the atypical onset and the bizarre degree of the ataxia. Had there been no accident, the ataxia would not have appeared when it did, but would have later developed with its usual insidiousness.

In those cases I found on first examination, in one, absence of one knee jerk, in two, of both; in two, complete, in one incomplete Argyll-Robertson pupils; in all three some hypotonia and some sensory loss;—typical signs of syphilis and locomotor ataxia.

We know from the work of Minor, of Moscow, and others, that slight lacerations of the lymph and vascular capillaries of the cord may occur after severe accidents to the spinal column. But such changes are not confined to the root zones and to the dorsal columns. Such changes cannot produce only the signs which were discovered in these tabetics. And such changes occur after severe accidents, not after the ludicrously trivial occurrences which were in these three cases dignified by memory as accidents mainly because the ataxia then appeared.

The trivial accident could not possibly have caused structural changes in the nervous system. A widespread, latent, unsuspected neuro-muscular defect of a tabetic nature must have existed before the accident.

Before the inciting injury, the nervous lesions, whatever their incoördinating tendency, were yet inadequate to produce ataxia; any potentiality for ataxia they possessed *was* latent and ***remained*** latent until the accident in which ataxia was made manifest.

The slight accidents which established ataxia were trips, stumbles, and falls. In those cases in which trivial injuries produced sudden ataxia, the mechanism which was directly affected was that of progression.

As these accidents were too trivial to produce organic lesions, and as their effect far exceeded that of severe mutilation, the petty mishap, the momentary interference with progression, must have profoundly influenced the psychic component of coördination in these tabetics to cause the onset of ataxia. The mishap acted as an electric spark acts in an explosive gaseous mixture; it produced a psychic explosion which precipitated the patient from coördinate movement into ataxia. The psychic component of coördination before or at the moment of the mishap must have been on the verge of disorganization.

If the fall be the dominant factor, then other things being equal, those tabetics most liable to fall must be the most ataxic. Those tabetics most liable to fall are the blind. They, in their blindness, stumble more than any preataxic tabetic. Yet ataxics, when they become blind, may become less ataxic; and blind tabetics are less prone to develop ataxia than seeing tabetics. Hence, we must conclude that the nature of the injury is not the dominant factor. The importance of the injury may partly lie in its nature (an interference with progression) but it mainly lies in its power to reinforce the incoördinating tendency of the mental state which at the moment of the accident exists. The effect of the mishap in these cases is not unlike that of a foreign body dropped into an over-saturated solution; the ataxia is initiated by the mishap just as crystallization is by the foreign body.

An elderly gentleman formerly under my charge in hospital, three years ago decided, not without misgiving, to trust himself for the first time in his life for a short holiday among the perils of the Continent. He was visiting a cave somewhere in the Low Countries. A steep staircase led into this cave, which was lit by electricity. The patient told me he did not like the escapade at all: to go under the earth alone with foreigners seemed to him in the highest degree hazardous. Suddenly all the lights went out.

The darkness was absolute. His worse fears seemed about to be realized. He stretched out a panic-stricken foot for the next step, and felt—nothing. Then he collapsed, was gently carried out of the cave, and tended in the local hospital. He had completely lost his power of walking. When I saw him two weeks later, the "paralysis" which had struck him, was an incapacitating ataxia and nothing more. He had marked ataxia, no knee jerks, Argyll-Robertson pupils, and other classical signs of tabes.

Another, whose case I have twice demonstrated at the Post Graduate Medical School, who was sent to me by Dr. Vincent Williams, and who was formerly a medical student, told me that he consulted a doctor for pain in the stomach, accompanied by vomiting, having no relation to food, and occurring in inexplicable spells. He swallowed many drugs during many days. He then, six years ago, had transient double vision. Next, about four years ago, sudden pains in his legs appeared which another doctor called rheumatic. He visited a third doctor a year later who, for the first time, associated the word "shooting" with the pain. There arose in the patient's memory a medical tag twenty years old, and he asked if "shooting pains" were not typical of locomotor ataxia. The doctor agreed that they were. "Have I locomotor ataxia?" "I don't know, I am no nerve specialist." The patient who had entered walking well, now greatly perturbed, with much difficulty reeled home. Two weeks later he could not walk without the aid of a stick. His ataxia thereafter swiftly incapacitated him wholly.

From literature and from report I could multiply these examples considerably but I think that what they teach is so obvious that further instances are unnecessary for the purpose of this paper.

The tourist volunteered that he was much perturbed from the moment he began to descend into the cave. Indeed, he was led to take his trip to Europe because he felt completely "run down" and nervous. The whilom medical student stated that he had steadily grown more worried as his illness progressed. He thought that locomotor ataxia was associated with shooting pains, that it affected walking and that it was incurable. He was literally staggered by the suspicion that he had this much-dreaded disease. His power to walk perfectly had survived unimpaired through five years of his malady. A correct diagnosis was more pernicious in its immediate effects than five years of mistaken therapy.

Why should the slight psychic influences of a fall, or a fright, prove efficacious in precipitating ataxia? The tabetic fears a thousand times a day. Before the ataxic moment, when the incriminated shock was experienced, many such doubtless occurred, but none was followed by ataxia.

Here, we must again recognize the great importance of the psychic state at the moment of the injury. *Upon the mental state at the moment of the injury depends the degree of the shock and the power of the shock to induce ataxia.*

The sole aspect of the mental state which is of importance to the result, so far as we are at present concerned, is that which is vaguely termed cerebral control. We may imagine every brain at any given moment to possess a certain definite degree of this power to control its experiences so far as such experiences affect the ordinary cerebral functions. This control as regards any given function must depend upon the degree to which that function is established. The degree to which the function is established must vary according to the biological capacity of the individual brain, the nutritional influences exerted upon the brain, and the amount of education in the function which the brain has received. Toxic influences, such as tobacco and alcohol, and disease processes, such as engender syphilitic neurasthenia and general paralysis, will affect the control of the function either in a general or in a special way according as the function is a generalized or a localized brain function and according as the pernicious influences act generally or locally.

The loss of control due to actual cerebral disease tends to increase so long as the action of the disease-producing agent persists.

Tabes progresses in pain and disability which maintain the patient in a constant state of psychic stress in all his relations with the external world. There tends thus to be a progressive loss of cerebral control as the mental strain of enduring crises, pains, ataxia, etc., increases. The cerebral control tends constantly to vary throughout the course of the disease, according as the daily strain of living with tabes temporarily increases or diminishes.

The effectiveness of the actual cerebral control in tabes tends constantly to diminish. At a given moment it is equal to the biological cerebral control increased by the amount of control derived from education, and diminished by adverse nutritional influences, by cerebral disease processes and by the stress of the tabes.

In using the term cerebral control I mean not to imply that the control is consciously exerted. It may be. But the lessening of ataxia during favorable mental states such as freshness, cheerfulness, and calmness and the increase of ataxia during adverse mental states are merely phenomena of the mental states.

Nor do I mean the term to imply the mode of action of the cerebral influence. Cerebral influence may possibly be exerted in a positive manner upon the sensitivity of the coördinating mechanism; improvement resulting from psychic causes may actually represent enhancement of the reflex coördinating mechanism. But the cerebral influence may possibly be exerted in a negative manner; cerebral influence may diminish reflex coördinating power and improvement may be due to a freeing of the automatic coördinating centers from disconcerting cerebral action; or there may be different kinds of cerebral influence, some diminishing and others increasing coördination.

To avoid misconception we shall group the cerebral with the automatic or reflex coördinating influences and discuss them together as coördinating power. In tabes dorsalis certain characteristic structural morbid changes in the peripheral, spinal, cerebellar and vestibular elements of the reflex automatic mechanism occur; and changes in the psychic component of coördinating power also arise. We may regard these changes, in so far as they diminish coördination, as a constellation of ataxia complexes, among which we may distinguish two essential groups, a physical and a psychic.

If the effectivity of the ataxia complexes exceeds the coördinating power we get ataxia. The measure of the liability to ataxia at any moment, what we may call the coefficient of ataxia, is the ratio of the ataxic complexes to the actual coördinating power at the moment.

$$\text{Coefficient of ataxia} = \frac{\text{Ataxic complexes}}{\text{Actual coördinating power}}.$$

In the cases we have just cited the onset of ataxia, the coefficient ataxia was at the ataxic moment suddenly, by accident or shock, increased above unity. In those in which a slight accident, a slight fall, precipitated the ataxia, we may conclude that immediately prior to the fall their coefficient of ataxia was unsuspectedly near unity, so near that the slight increase in the psychic group of the ataxic complexes resulting from the accident, or shock, was sufficient to raise the coefficient above unity. Otherwise ataxia could not have resulted. In all previous accidents or shocks which these patients sustained, the coefficient of ataxia was safely below the *ataxic threshold,* so that the increase of the ratio which then resulted was inadequate to exert a visible effect upon coördination. So long as the denominator of this formula is greater than the numerator, adequate repression of the ataxic tendency must prevail.

In addition to the incoördinating influence of fear in tabes another effect on movement is often seen, a paralyzing effect. Some tabetics when seated dread to stand, when standing dread to walk, when walking are disturbed to a ridiculous extent by trivial obstacles. One whom I demonstrated in June at the Post Graduate Medical School, and who is still a patient there, could walk excellently in my office even without a stick, yet he began his effort before the class by insisting punctiliously upon the arrangement of his surroundings—moving a chair and lifting a piece of paper from the floor,—by adjusting his garments, by rubbing his moist hands, and by screwing himself up for a great endeavor. After two or three reeling steps he collapsed in a heap opposite an imperceptible crack on the floor. Supported by my little finger, which he rigidly clutched, he circled freely round the amphitheatre. Asked to stand with his eyes shut he swayed and fell, or collapsed without swaying. This patient told me that in these circumstances he could not remember how to move so that when I urged him to walk he could only collapse upon the floor. His disability vanished the moment he was reassured even by the slight support of my little finger, an aid altogether disproportionate to its effect.

It is perhaps not out of place here to refer to the analogous states which sometimes arise in sleep. With the limited misty consciousness peculiar to disturbed slumber, sometimes an inability to move associated with intense fear arises. The sleeper knows the cause of the fear and realizes that if he can only move even a toe, the fear will vanish; but the struggle to attain that movement is none the less frightful. This tabetic said he knew his fears were groundless but none the less he could not move except with aid. With the slightest aid his fear vanished just as the terror does when the sleeper can move.

In another form of pavor nocturnus a feeling of falling down precipices into bottomless pits arises. An analogous state occurred in this man when he attempted to move unaided and in public. With the slightest aid he could move freely, so a faulty reflex mechanism was not the root of his trouble; nor was faulty association of kinesthetic images to blame. The trouble seemed to be in a higher sphere, perhaps in the sphere where perception of posture lies, the sphere which has been shown by Head and Holmes to be situated probably in the cerebral cortex.

The ataxia in this person was preceded by nervousness, irritability and sleeplessness for fourteen months; during that time he was seen by several physicians and correctly deemed by them to be suffering from syphilitic neurasthenia.

An interesting corollary to this case is another at present under my care at the Neurological Hospital, Blackwell's Island. He refuses to walk and when coerced shuffles slowly and extremely cautiously along supporting himself on both sides and collapsing or threatening to collapse at frequent intervals. He is a taboparetic, blind in one eye, with laryngeal crises and he has been ill only since June. He has slight but evident ataxia.

In both of these it is not the coördinating power alone which is affected but the whole psychic mechanism of progression; and with this affection is a certain degree of general mental deterioration.

Besides these extravagant effects lesser but distinct motor results of fear are evident in the great majority of tabetics. All tabetics tend to be more ataxic in public; at the change of surface and of level at street crossings; in traffic, the open, and the dark; and under the stress of emotions and the influence of depressing weather conditions. No matter how carefully reëducated by Frenkel's method a tabetic may be he can only exceptionally be induced to discard his stick. And the attitude of the ataxic—his inappropriate wide base, his curious mixture of exaggerated and restricted movement, his rigid maintenance of the ill-judged muscular contractions which he thinks are indispensable to balancing,— is, in part, an expression of the fear and tension in which he lives.

The effect of fear upon tabetic symptoms cannot be overestimated. We saw from the last two cases that the psychic mechanism of progression may be affected in its entirety by fear. We

THE CATATONIC SYNDROME AND ITS RELATION TO MANIC-DEPRESSIVE INSANITY[1]

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Since the valuable work of Kraepelin began to make itself felt in psychiatry, one of our main clinical problems has been to bring to a test the new prognostic principles which formed such an important part of Kraepelin's contribution. In dealing with the large mass of the so-called functional psychoses, Kraepelin maintained that when a thorough study of the cases was made one could recognize in the early stages of these psychoses certain symptoms or groups of symptoms which indicated either a good or bad prognosis, and thus one was enabled to differentiate two distinct types of disorders,—manic-depressive insanity, a recoverable psychosis, and dementia præcox, a deteriorating form of mental disease. In other words, that one could read the prognosis from the symptom-picture.

Much of the criticism that Kraepelin's teaching aroused had a reasonable foundation and expressed the clinical experience that while the symptomatological distinctions which he put forth allowed a considerable number of cases to be prognostically grouped, yet numerous other cases did not yield to any such differentiation. In some psychoses there appeared to be a puzzling combination of symptoms of supposedly diagnostic value, in others deterioration seemed imminent or even established, yet recovery took place; it was found further that many benign and recurrent psychoses did not fit into the manic-depressive formula. Adolf Meyer early recognized these defects in Kraepelin's presentation and showed the desirability of keeping certain cases apart as "allied conditions" and looking upon others as "undifferentiated types." Meyer opposed Kraepelin's contention that dementia præcox and manic-depressive were two separate and distinct disease processes, and offered the broader conception of biological reaction types: these psychoses, instead of being symptomatic of brain disease in the usual sense, represent types of defective psychobiological adaptation.

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[1] Read before the New York Psychiatrical Society, May 14, 1913.

It is now generally recognized, and indeed conceded by Kraepelin himself, that the boundaries of the dementia præcox group were originally far too widely drawn. In the reaction which is taking place the prognostic value of certain symptoms and groups of symptoms must of course be constantly revised. As a contribution to this subject I wish to offer a brief discussion of the catatonic symptom-complex and especially of its occurrence in individuals who have also manic-depressive attacks.

As is well known, Kraepelin claimed for his dementia præcox group, practically all non-organic cases with catatonic symptoms and looked upon these manifestations as especially significant of a deterioration process. It is interesting to note that Kahlbaum, who so clearly described the catatonic complex forty years ago, did not view the prognosis in these cases as particularly bad, in fact he rather believed that the tendency was toward recovery from the attack and thought that only certain cases progressed to the stage of dementia. Under the influence of the later teachings of Kraepelin, however, catatonic symptoms came to be and are still generally regarded as an almost sure sign of a deteriorating psychosis. Kraepelin admitted that the catatonic forms ran a somewhat different course from the other forms of dementia præcox, that in fact about 13 per cent. of the catatonics appear to recover; but the permanency of these recoveries he regards as unsettled and inclines to the view that they are probably only remissions.

Other observers formed widely varying opinions as to the prognosis in this group of cases. Aschaffenburg for instance claims that no catatonics completely recover, that at least mild residual symptoms can be invariably demonstrated. E. Meyer found that from 20 to 25 per cent. of the cases recovered. Of special interest is the study of Wilmans, who reviewed Kraepelin's own Heidelberg cases and found that catatonic symptoms as evidence of a deterioration process had been greatly overrated, as the later history of many patients proved that recovery had occurred.

It cannot be doubted that very marked catatonic symptoms occur in conditions other than dementia præcox, even in the clearly organic psychoses. In brain tumor, general paralysis, traumatic affections and in epilepsy we may meet with symptoms which resemble in a most striking manner the catatonic pictures with which we are familiar in dementia præcox. Bonhoeffer has called attention to the very pronounced catatonic symptoms which may occur in infective-exhaustive psychoses. He finds that these conditions, which he calls symptomatic catatonic reactions, often cannot at first be differentiated from the deteriorating catatonic cases, at least not on ground of the symptom-picture alone. Kraepelin of course admits that catatonic symptoms appear outside of dementia præcox, but he claims that as a rule one finds only isolated catatonic traits, never a fully developed and persistent catatonic symptom-complex such as occurs in dementia præcox.

The catatonic syndrome is not in any sense a clinical unit, and it is not to be doubted that under this designation cases are likely to be brought together which have only a superficial resemblance. It is quite probable that deteriorating and non-deteriorating catatonic cases represent fundamentally different reaction types, but at the present time our knowledge of what these differences are remains very imperfect.

No satisfactory explanation has been found to account for the origin of these peculiar symptoms, and we know almost nothing of their deeper meaning and the mechanisms involved in their development. Psycho-analysis has not thrown much light on the genesis of catatonic symptoms. The most typical catatonic manifestation, the negativistic stupor, has the general characteristics of a defense reaction or of a protective mechanism whereby the individual practically shuts out the external world.

Attention has been drawn to the resemblance between the catatonic stupor and the philogenetically old reaction seen in animals that in time of danger lie motionless as if feigning death. In a number of stupor cases which we have been able to analyze, at least partially, it was clear that the stupor symbolized the death of the patient. In many cases, however, notwithstanding a good memory for the period of the attack, one obtains little or nothing from the patients in the way of an explanation for their conduct; they seem to be often quite ignorant of any conscious motives for their behavior. In the cases that become accessible a study of the deeper trends by means of psycho-analysis will no doubt give us much valuable information regarding the nature and meaning of catatonic symptoms.

On the other hand we know that many forms of aversion cannot be easily separated from catatonic negativism, and much so-called negativism is, when analyzed, found to be understandable as a consciously assumed attitude toward an unpleasant emotional situation. We thus find states of obstinacy and irritability simulating negativism and in cases where the sensorium is somewhat clouded or where there is a great degree of perplexity or severe retardation, the behavior of the patient may appear markedly negativistic.

Upon investigating recently the outcome of a large series of manic-depressive and dementia præcox cases, we found that a good many cases had been wrongly judged to be deteriorating types because of the presence of catatonic symptoms. For sometime we have been accustomed to group as merely "allied to dementia præcox" the acutely developing catatonic stupors when it could be shown that the attack had not been preceded by any ominous prodromal symptoms. The after history of these cases shows that, with few exceptions, recovery takes place and in some instances after a duration of several years.

An interesting example is the case of a married woman 31 years old. She was bright and smart, never considered peculiar. The onset of the psychosis was sudden, two days after the death of a three months' old baby. The patient showed from the first stuporous symptoms with occasional episodes of excitement and reaction to hallucinations. She was taken care of at home for five months and then brought to the hospital.

For 5¼ years the patient showed in the hospital a very typical catatonic picture. There were mutism, general resistance against passive movement, muscular tension, fixed postures, hands clenched, head flexed with chin on the chest, steady gazing and at times catalepsy. For several years the patient was regarded as a deteriorated catatonic. The clearing up was gradual with complaints that she felt dazed, that her memory was poor, her head dizzy. She convalesced steadily and was discharged as recovered 6¼ years after admission.

The retrospective account showed that the patient had little recollection for the stupor period, the lapse of memory beginning with the funeral of her baby and covering most of the succeeding 6 years. The patient left the hospital with complete insight, returning to her domestic duties, and has since been in all respects as bright and efficient as before the attack; she has borne two healthy children and at the present time, five years after her release from the hospital, there is no reason to doubt her complete recovery. In this case there was nothing in the patient's make-up or in the development of the psychosis to suggest deterioration but the symptom-picture and the long duration led to an erroneous conclusion.

The possible relation of these acutely developing and recoverable catatonic stupors to the manic-depressive group comes into consideration, because the subsequent history of a good many such stupor cases shows that very typical manic attacks not infrequently occur later on. It is just this group of cases which I wish to discuss more particularly, namely, patients who show at one time very marked catatonic states and at another time very characteristic manic-depressive pictures. In the catatonic phase these patients are almost invariably looked upon as cases of dementia præcox, if a manic attack then develops this conception is somewhat upset and the case regarded as atypical and grouped usually as allied to dementia præcox. As illustrations of these types a few clinical observations will be briefly presented:

The first case is that of a bright and industrious girl of 18, who developed a psychosis rapidly within three weeks before admission to the hospital. The patient was shocked by receiving a false report of her father's death. An excitement followed which was typically manic and lasted for a month; then the patient passed into a perfectly characteristic catatonic stupor. She was mute, refused food, kept her eyes closed, held saliva in her mouth, showed general resistance and muscular tension. The muscular rigidity was often extreme. The fingers were clenched, the lips puckered. By placing a hand under her head the whole body could be raised from the bed while she rested rigidly on the heels alone. Peculiar behavior of various kinds was noted; *e. g.*, at times she would hold her breath until blue in the face; then, finally expelling the air she would take in a breath with a loud gasp, repeating this for many hours.

The stupor lasted for six months; then rather abruptly a typical manic excitement again developed. The patient was then exalted, playful and erotic. Flights, rhymes and sound associations were produced with extreme distractibility and marked restlessness. Having in mind the fact that the patient had shown such a pronounced catatonic phase, we scrutinized this excitement closely but could see nothing in it suggestive of a catatonic excitement. The patient was always in close contact with her environment, the activity was free and unstrained, there were no signs of stereotypy in speech or behavior and nothing to suggest hallucinations. This excitement lasted about two months; then the patient made a rapid recovery and was discharged with good insight about eleven months after the onset of the psychosis.

The review of the psychosis showed that the patient had a good memory for the period of stupor. She knew the names of all those who had attended her and recalled many minor incidents of that period. The only explanation for her negativistic behavior was that she was depressed and wished to die. No hallucinations or delusions established retrospectively. After leaving the hospital the patient resumed her occupation, and at present, 5½ years after discharge, she remains well.

Another case is that of a native-born Jewess, aged 18, of lively and sociable disposition. At the age of 14, with the establishment of menstruation, the patient was depressed and inactive for six weeks; had an idea that the food was poisoned. Recovered at home.

At the age of 16 she had another attack, which began acutely with depression and general slowing down in speech and action. She again spoke of poison in the food. She was brought to the hospital, where for five months she showed stuporous behavior and catatonic symptoms. She was mute, resistive, gazed vacantly, refused food, paid no attention to pin pricks. She was then looked upon as a case of dementia præcox. She recovered with good recollection for the stupor period, during which there had been hallucinations and various dream-like ideas; *e. g.*, that she was dead and in a cemetery, had a cross inside of her body which interfered with the beating of her heart, etc. Analysis of this trend showed that it referred to an attachment she once had for a youth, but which she repressed because she was a Hebrew and he a Christian.

The patient remained well for over a year, then at eighteen she had a third attack, when for the first time manic symptoms appeared. The attack came on rapidly with restlessness and elevation of spirits, and for the first six weeks in the hospital the patient was highly excited and required treatment in the continuous bath. The free activity, marked exaltation, playfulness, distractibility and flight of ideas seemed to make up a very typical manic picture.

After continuing for about six weeks, this excitement was succeeded by a catatonic phase. The patient grew quiet, dull and inactive, then completely silent; stared fixedly, paid no attention to painful stimuli, would protrude the tongue to have a pin stuck into it. The limbs showed catalepsy; she walked in a peculiar manner and maintained certain postures for long periods. Another sympton noticed during this stupor period and thought to have a bad significance was the tendency to smile or occasionally to laugh out in a rather explosive fashion and without apparent reason. These catatonic symptoms lasted six months, then the patient cleared up and recovered with good insight. As in the previous stuporous attack there were hallucinations and dream-like ideas: her head had not felt clear; she thought she was in school and not permitted to talk; again thought her tongue would be cut out if she spoke; she kept her limbs in given positions because she thought the physician wanted her to do so.

In this case there have been three attacks; the first a short depression, the second a catatonic stupor, the third a manic excitement followed by a catatonic state lasting six months. Three years have elapsed since the last attack; the patient has in the meantime married, passed through a childbirth and at present remains well.

Cases of this type and the preceding one seem to show that a catatonic phase may replace the depression in what appears to be a circular attack.

The next case is of a somewhat different type because of the many quick alternations shown from a catatonic to a manic state. A young woman of 19, lively in disposition but subject to fits of blues. The psychosis developed acutely two weeks before admission to the hospital. The patient complained of not feeling well, had crying spells, and at times would not talk. She had several attacks during which she held herself rigid, rolled her eyes upward and forced saliva from the mouth. Following the attacks she would laugh and talk loudly. In the hospital the patient was for seven months in a condition looked upon as a typical catatonic state with the exception that the stuporous behavior was often interrupted by periods of excitement of a manic character. The sudden changes from one phase to the other were especially striking. In the stupor the patient showed marked rigidity, spring-like tension in the limbs, peculiar postures, mutism, drooling of saliva and absence of reaction to pin pricks. In the midst of the stupor she would sometimes suddenly make a remark or spring out of bed, impulsively strike, or she would burst into loud laughter. During the episodes of excitement she would relax completely, sit up in bed, appear bright and happy, sing, make facetious remarks, show distractibility and flighty talk. A tendency to reiterate words and phrases was at times noted in her stream of talk and was thought to be a point in favor of a catatonic excitement. The excitement was usually terminated abruptly by the reappearance of muscular negativism and mutism.

After eight months in the hospital improvement began, and nine months after admission she was discharged recovered. The patient gave willingly a retrospective account. Her recollection of what had occurred during the attack was in general good; she had not been in a delirium or hallucinatory state; no special trends were established; no motives, or only superficial ones, could be obtained for her mutism, refusal of food, rigidity and other catatonic symptoms. Her reasons for not talking were that she didn't feel like it, had no interest, or felt melancholy; yet she could mention no cause for depression. She said that her limbs had felt stiff but claimed no recollection for some of the fixed postures which were long maintained; recalled, however, that she kept her head raised from the pillow but could offer no explanation.

The patient on returning home resumed her occupation and now, after an interval of nearly four years, she is still well.

The next and last case which will be described is one rather more complicated, with trends more prominent. During the course of a long depression the patient showed a very pronounced catatonic phase; then finally before recovery a brief manic outburst.

A woman admitted at the age of 30. A rather open personality, jolly and sociable in disposition; an efficient saleslady prior to her marriage at 23 to a mechanic, with whom she lived happily. At the age of 25, during the lactation period, the patient had a mild psychosis, which appears to have been quite a typical insufficiency depression of the manic-depressive type. She was treated at home and recovered in six months.

The patient remained entirely well for five years and then developed a second attack. This came on gradually and was in the beginning very similar to the previous attack; depression of spirits, despondency, slowness in action, loss of ambition, nervous feelings and fears, particularly when alone; there was also criticism of self for not doing more work and ideas of sin, which referred to an abortion which had previously been performed. Desire to die and suicidal tendencies led to her admission to the hospital six months after the depression began.

A few days after entering the hospital the depression deepened; she became very anxious, begged to be saved, talked of a terrible death, the electric chair, etc. Then very marked catatonic symptoms appeared: these were fixed gazing, mutism, maintaining of peculiar postures, resisting any change of position, showing strong spring-like muscular tension in the limbs and neck. There was no reaction to pin pricks and the urine was held back so that catheterization was necessary. This pronounced catatonic behavior lasted about a month, but during this time there were rather striking variations in the symptoms—periods of relaxation would occur, then suddenly the rigidity and negativism reappeared. At times she would talk a little, then relapse into mutism. What she did communicate resembled delirious experiences; spirits told her she must pick out her eyes and brains; she was on a ship in a coffin; went up to Heaven; saw the Lord hanging on a cross, etc. When accessible for questions, we found that notwithstanding these delirium-like utterances she was well oriented and there were no physical signs of delirium.

Following the disappearance of the marked catatonic symptoms just mentioned, the patient was for eight months longer in a depression which was in many ways peculiar and which indeed presented a number of catatonic-like traits. Her manner was decidedly constrained; occasionally she got into peculiar attitudes. At times she would not speak; she seemed preoccupied and much perplexed over occurrences about her. As a rule she was slow and inclined to be resistive. At other times she was freer in speech and action, the affect always seemed to be deep and she showed especially irritation and annoyance over trivial occurrences. Various peculiar ideas were uttered, which in face of relative clearness of the sensorium were looked upon as of rather serious import. She claimed, for instance, that the floor was full of electricity; thought the chairs knew what she was talking about; she referred to herself a few times as the Queen of England; went about kneeling at the bedside of other patients; kissed them; made a cross on each picture hanging on the wall. This depression continued for about eight months; then the patient passed rather abruptly into a hypomanic state. She was elated, over-active; erotic, sang and danced gaily about—this excitement lasted two weeks; then she rapidly convalesced and recovered with excellent insight. Her memory for the stupor period was good, but she could not give explanations for the catatonic behavior. Nearly seven years have passed since the patient left the hospital; she has had two children during that time and there has been no return of mental symptoms.

The foregoing cases represent types which are not uncommon, but it appears that most of them have hitherto been looked upon as cases of dementia præcox or allied conditions, and as a result many erroneous forecasts have been given, as proven by a study of the subsequent histories of the patients. From the point of view of formal symptomatology we find that very similar clinical pictures occur in deteriorating and non-deteriorating cases and that in all cases the most reliable prognostic data are gained from a study of the personality and the mode of development of the psychosis. Acute catatonic stupors arising without prodromes of dementia præcox or other evidence of a transformation in the personality have a good outlook, although the attack may be long and severe. Many of these cases are apt to have excited attacks and seem to have a relation to the manic-depressive group.

We have also shown that marked catatonic syndromes may appear in otherwise typical manic-depressive cases. In some cases a catatonic attack apparently replaces the depression in a circular psychosis. In cases showing both manic and catatonic phases the manic-depressive features have the greater prognostic significance. There can be little doubt that Kraepelin over-valued catatonic manifestations as evidence of a deteriorating psychosis, and that many of these cases have served to unduly swell the dementia præcox group.

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NOTES ON SUNLIGHT AND FLASHLIGHT REACTIONS AND ON CONSENSUAL AMYOSIS TO BLUE LIGHT[1]

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In the current neurological and ophthalmological literature the method advised for testing the pupils for their reflex response to light is to place the subject in a dark room and either to flash into the eye examined the light from a burner focused by a convex lens or to flash reflected light by means of an ophthalmoscope. In ordinary clinical practice the light from a pocket flashlight is used instead and is considered to give fairly accurate results. In most places testing the pupils by window illumination, that is by sunlight, is considered poor technique.

We have observed in several cases of general paresis that pupils immobile to flashlight were smaller by day than by night. This led us systematically to compare the flashlight with the daylight as to efficiency in bringing about pupillary reaction. We found no case where with proper technique daylight did not bring a reaction where the flashlight did, but we did find cases, especially in general paresis, where with no reaction obtainable by the use of the flashlight daylight brought about a *smaller* pupil, although in some cases the *movement* itself could not be observed.

One of our cases, and the one which brought about the following study, deserves special mention. An alcoholic patient had when first examined pupils that were absolutely rigid to flashlight or even to the laboratory dark-room technique. Through the course of a few days the reaction to flashlight gradually returned, but it never became so prompt or so complete as that to daylight which from the first had been present. Fundus examination revealed no definite change. The examination of blood and spinal fluid, including Wassermann, in each globulin and cell count, was negative. In the history of the patient was a period ten years before of sudden loss of vision following an alcoholic debauch.

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[1] Read before the Boston Society of Psychiatry and Neurology, April 17, 1913, being Contributions from Psychopathic Hospital, Boston, Massachusetts, Number 21 (1913.21). (*Bibliographical Note.*—The previous Psychopathic Hospital contribution was Number 1913.20, entitled "Some Observations on the Conditions and Treatment of Stuttering," by Miss C. Charnley, published in the *Boston Medical and Surgical Journal.*

An observation of Oppenheim in 1911 has some bearing on the above noted facts. He found that in a few neuropathic individuals the flashlight caused either a momentary dilatation (paradoxical reaction) or else the pupil remained stationary. These phenomena he explained as caused by fear or fright, which, as is well known, dilates the pupil.

Bartels, in considering Oppenheim's paper and in view of his own work, believed that in the few cases where the pupil reacts better to sunlight than to artificial illumination the macula is inadequately stimulated. This explanation is held by Hey to explain part of the cases, while the rest he believes can best be explained according to Oppenheim.

We believe, differing thereby from the above cited authors, that practically all pupils which react at all will react to daylight and that of these some will fail to react to the artificial illumination as commonly employed. We wish to emphasize that the *movement of reaction* is sometimes invisible but the size of the pupil becomes lessened, which means reaction. Our explanation, tentative at the best, is that diffuse sunlight, striking every part of the retinae of both eyes at once is a better stimulus than a small beam of light, no matter what its intensity, stimulating only one retina and probably only the central part of that, with the other eye in darkness.

The question arose as to whether or not there were specific color qualities in daylight which might be specific in their stimulating power. This brought about the following research, undertaken to determine the properties of three colors, red, green and blue, in bringing about reflex responses of the pupil.

Methods Used.—Three photographic color filters or screens used in tri-color photography and manufactured by the Cramer Research Laboratories in St. Louis, under the direction of Professor James Wallace, were used. The red embraced that part of the spectrum from 5,875 to 7,000 units, the green from 4,900 to 6,000, and the blue from 4,100 to 4,900. The blue here represents almost a pure color, the green has very slight admixture of red, and the red has a slight admixture of green. They are equally luminous and in fact are selected for that purpose and so represent for the purposes of this study, namely, the response of pupils to color stimulation, and almost accurate series. The patient is seated and the accommodation relaxed by gazing upon a wall twenty feet distant. The room is dark except for the light cast upon the patient's eyes from a Nernst light, single blower, 110 volts, five feet distant. Of the two observers necessary for the experiment one holds close before the patient's eyes any two of the screens, thus shutting out practically all light from that eye. (For example, if the red and green screens be held before his eyes, the red nearer the light and the green nearer his eye, the former will filter out of the spectrum all save the red rays and pass these on to the green filter which then excludes them from the eye, thus excluding practically all light.) This produces a consensual dilatation of the opposite eye which the other observer, by means of a convex reading lens of about twelve diopters, carefully watches. One of the screens is then quickly withdrawn (say the red, in the example) and the light passing through the second screen stimulates the retina with its color (green, in the example), producing a consensual contraction of the pupil. If the red and green are first paired by a few trials, generally by one, it can be noted which gives the prompter and greater reaction, and then this screen is paired off with the blue and the results compared.

The reaction which will be observed is a consensual one. This is necessary since it is impossible to watch the pupil of the eye illuminated by a colored light. We made repeated attempts to measure accurately the reaction in the consensual eye by means of rather elaborate apparatus, but found that the simple hand lens held so that it did not obstruct the light was a very satisfactory method. While no actual measurements have been made, comparative measurement has been perfectly simple and certain in by far the most of our cases. We have examined in this manner forty cases taken at random from our clinical material. Our object has not been as yet to evaluate what we have found but rather to determine the existence of selective color pupillary reaction, and our results have established this.

The objection will be raised, and properly, that color screens of no matter what manufacture do not give pure colors. Granting this we believe that the screens used are sufficiently monochromatic for the purpose of clinicians and that the results established will stand the test of more nearly ideal apparatus. At a future time we shall use selected portions of spectral light, which of course will place the results obtained on a more secure basis.

Our cases may be grouped as follow:

1. A group in which all three colors gave prompt reactions, but with the order of amplitude of reaction—red, green, blue.
2. A group in which red and green gave fairly good reaction and in which blue was distinctly impaired.
3. A group in which, red and green being present, blue was absent. This group includes an alcoholic hallucinosis, a recent cerebral thrombosis, a heredo-syphilitic with marked refractive error, a dementia præcox with history of alcoholism, a case of albuminuric retinitis, a case of alcoholic dementia, a case of dementia præcox with a positive Wassermann reaction, one case of organic cerebral disease of unknown type, and the case of a neuropathic individual presenting unusual neurasthenic and psychasthenic symptoms.
4. A group of two cases of general paresis,—one case having entirely absent color reflexes as well as Argyll-Robertson pupils, the other presenting in one eye a very sluggish pupillary response to light and red alone being present of the color reactions.

To summarize: The consensual pupil reacts in a selective manner to the colors, red, green and blue, in the order mentioned. The blue disappears first of all if there is disease; the green probably next, although we have only one case where with the red persisting the green has absolutely disappeared, despite our observation of several cases where it seems distinctly impaired. Aside then from the theoretical importance of probable selectivity of color reactions, there seems to be opened a field of research of possibly great clinical value.

For some time after we had finished this preliminary work we found no reference in the literature on the subject of color reflexes. Through the activities of Professor E. E. Southard, director of this hospital, the researches of others were called to our attention,—particularly those of Sachs, Abelsdorf, Hertel and Hess. None of these workers has attempted to bring the matter within the clinical field, and in fact they have largely confined their experiments to animals.

Sachs, obviously working to substantiate the Hering theory of vision, found that the brightness component of colors was the important and essential factor in bringing about a pupillary reaction. The reflected colors of pigment papers were the stimuli he employed.

Abelsdorf, using color screens, found that the pupils of doves reacted far better to red than to green or blue,—whereas using exactly the same paraphernalia, the pupils of *Athena noctua* reacted better to blue than to red.

The researches of E. Hertel have no direct bearing on the subject as here treated, since he worked on animals in which the optic nerve had been severed. Under these conditions he stated that the ultra violet end of the spectrum gave the promptest and most vigorous reactions, while there was a steady diminution of reaction toward the red end.

In the later work of Hess, spectral light and photographic measurement have been employed to give greater accuracy to the results. In day birds the reaction to red-yellow and yellow was the greatest, while green and blue gave lesser reactions in the order named. In night birds the reaction was greatest in the green and shaded off towards the red and blue ends of the spectrum.

The above-cited researches, as well as our own work, make specific reactions to color probable. Even should the differential response be found to depend upon luminosity, the method used affords an accurate way of ascertaining and measuring early changes in the pupil.

TABLE OF CASES EXAMINED

Key to signs used: +++ Best reaction. ++ Moderately good reaction. + Moderate reaction. ± Sluggish. — Absent.

Case No.	Sex	Age	Diagnosis		Red	Green	Blue
Group 1 1,346	M	35	Alcoholic hallucinosis	O.U.	+++	++	+
11,566	M	40	Unclassified	O.U.	+++	++	+
11,523	M	9	Delinquent	O.U.	+++	++	+
11,426	M	34	Alcoholic hallucinosis	O.U.	+++	++	+
11,508	M	16	Delinquent	O.U.	+++	++	+
11,483	M	11	Defective	O.U.	+++	++	+
11,316	M	20	Depression	O.U.	+++	++	+
1,491	F	35	Alcoholic hallucinosis	O.U.	+++	++	+

In addition to these, eleven members of the staff were examined all of whom gave the above formula.

Case No.	Sex	Age	Diagnosis.		Red	Green	Blue
Group 2 11,434	M	47	Alcohol	O.U.	++	+	±
11,402	M	34	Unclassified	O.U.	+++	++	±
11,530	M	53	Depression	O.U.	+++	++	±
11,438	M	33	Alcoholic hallucinosis	O.U.	++	+	±
11,557	F	43	Depression	O.U.	+++	++	±
11,568	F	22	Unclassified	O.U.	+++	++	±
11,509	F	54	Paranoid	O.U.	+++	+	±
11,596	F	23	Dementia præcox	O.U.	++	+	±
11,543	F	21	Unclassified	O.U.	++	+	±
Group 3 11,495	M	21	Dementia præcox, alcohol	O.U.	++	+	±
11,295	M	36	Alcoholic dementia	O.D.	+++	±	–?
				O.S.	+++	±	–
11,520	M	45	Dementia præcox, syphilis	O.U.	++	±	–
11,035	M	33	Psychasthenic	O.U.	++	+	–
11,503	M	37	Alcohol	O.D.	+++	++	±
				O.S.	+++	++	–
1,498	F	48	Organic diseases	O.U.	+	±	–
11,540	M	62	Cerebral thrombosis	O.U.	++	±	–
1,481	M	44	Alcoholic hallucinosis	O.U.	+++	±	–
11,556	M	38	Albuminuric retinitis	O.U.	+	±	–
11,579	M	17	Heredo-syphilis petit mal	O.U.	++	±	–
Group 4 11,409	M	39	General paresis	O.U.	– – –	–	–
11,452	M	36	General paresis	O.D.	+	–	–
				O.S.	–	–	–

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REPORT OF A CASE OF JUVENILE TABES[1]

By C. Eugene Riggs, A.M., M.D.

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Aside from the question of diagnosis the case I am about to report presents certain features of unusual interest which merit our consideration.

A., aged seven and one half years, was referred to me by Dr. E. B. Stebbins. Parents living and well; one brother five years, well; two sisters both dead from pneumonia, aged respectively nineteen months and two years. Mother has had no miscarriages. Both parents denied lues.

A. was a full term child, weighed 12 pounds. Delivery was normal. Labor lasted about 18 hours. He developed normally, was mentally bright, and memory was excellent. He began walking at 15 months. When ten months old he had a vomiting spell which lasted from two to three days; he had another at 18 months, another three months later, and still another at four years, then no more until five years old. The next one occurred after an interval of six months. Since then A. has had attacks at intervals of about three months. He first complained of being tired, soon after began to vomit food, then bile and finally a coffee colored fluid. These attacks usually lasted about three days although one lasted six days. They stopped suddenly. During the attack there is a very severe pain in the pit of the stomach which continues a day longer than the seizure itself, while the hands and feet become cold.

When A. was four and one-half years old his mother first discovered that he walked awkwardly, he would fall easily and walked up stairs with some difficulty. In March, 1912, he first complained of stiffness and of a tired feeling in the legs. Following an attack of measles in November, 1912, this condition grew much worse; general weakness developed for a time and when the patient attempted to walk he staggered like a drunken man. He could sit erect with difficulty, there being a tendency to fall forward. Following the vomiting attack in March, 1912, he complained of pain in the tendo Achillis, and sometimes in the calves of the legs, especially in the right one after walking. Since the measles he has had aching pains in the knees.

At first pain in walking would only occur after vomiting spells but since November, 1912, it has always been present when walking. There are occasional choreic movements in the right hand which at times assume an athetoid character. There was intentional tremor in both hands, only slight in the left. There were no sensory disturbances, no loss of deep sensation. Knee and Achilles jerks were absent; a suggestion of Babinski was seen in the right foot. There was marked ataxia of both legs, no nystagmus. There was a mild hypertonia in the muscles of the lower extremities, more marked on the left side. The pupils reacted to light and in accommodation and the eyegrounds were normal. Speech and urine were normal. The blood serum and the spinal fluid both gave a positive Wassermann. No lymphocytosis, no Nonne-Apelt, no Noguchi were obtained.

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[1] Read before the American Neurological Association, Washington, D. C., May, 1913.

At first I regarded A.'s trouble as an atypical form of Friedreich's ataxia rather than juvenile tabes. The age of onset, the loss of knee and Achilles jerks, the marked ataxia, the suggestion of Babinski in the right foot, the choreiform or at times athetoid movements, and the Friedreich's toe with a marked talipes pes cavus in both feet, seemed to justify such a conclusion. Yet I was at a loss to account for the associated gastric crises; these do not occur in Friedreich's ataxia (Oppenheim, Strümpell).

Blackader in 1890 reported a case of ataxia in a child twelve years of age in which the ataxia developed in the sixth year. There were no lightning pains, knee jerks were lost and there was talipes equinus in both feet. Micturition was slightly involved. The eyes were normal, speech was jerky, and there were attacks of vomiting associated with headache (migraine?). In the same connection he reported a case of Power in which vomiting was an early symptom and which closely resembled Friedreich's disease. Blackader regarded his case as one of atypical tabes because of the absence of eye symptoms and of lightning pains. He excluded Friedreich's ataxia because there was no familial history, no nystagmus or mental defect.

In a paper read before this Association in 1910 Spiller described a case of Friedreich's ataxia in which there were severe attacks of pain with nausea and vomiting which he said suggested gastric crises. According to Oppenheim the hyperextension of the great toe is not to be regarded as pathognomonic of Friedreich's disease yet one usually associates it and talipes pes cavus with this condition. Stewart has observed the latter in three cases of familial amaurotic ataxic paraplegia. Oppenheim states that he has seen cases of hereditary syphilis in which the diagnosis was uncertain and in which the morbid condition was closely allied to Friedreich's disease; Bury says that congenital lues may assume the clinical manifestations of disseminated sclerosis or Friedreich's disease. Hutchinson's teeth and choroiditis were not present in A., the only evidence of lues being gastric crises and a positive Wassermann reaction in the blood serum and spinal fluid.

A month after the boy's return home he was taken with a cerebral hemorrhage or what was regarded as such. There was aphasia with loss of power in right face and arm, probably due to syphilitic endarteritis, yet one must bear in mind that the brain lesion might be due to an embolus following the intravenous injection of salvarsan four weeks previously. According to Lewandowsky one third of his necropsies showed a patulous foramen ovale and he believes that emboli from the venous circulation through the foramen ovale into the brain occur much more frequently than is supposed, and it is not impossible that this might have taken place in our patient.

Ranke has seen the *Spirochæta pallida* in the brains of congenital syphilitics and Straüssler has observed the findings of paresis along with those of cerebral syphilis in the same subject. In the light of the recent investigations of Noguchi, tabes and paresis, being one and the same pathological process differing only in the point of initial localization, are direct and not indirect results (toxins) of the bacillus of Schaudinn. Thus we see the passing of parasyphilis. Congenital syphilis and juvenile tabes as seen in A. are alike manifestations of the activity of the *Spirochaeta pallida;* the only symptoms of the latter being the ataxia and the gastric crises, and ataxia is absent in about two thirds of the cases (Mott). Optic atrophy, pain, disturbances of micturition, the paresthesias and objective sensations, all so characteristic of juvenile tabes, were lacking.

A. was given three intravenous injections of salvarsan, one tenth of a gram. Examination of the spinal fluid just before he returned home gave a negative reaction although the blood serum was still positive. His general condition was greatly improved and the ataxia was less marked.

Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

Thirty-ninth Annual Meeting, held in Washington, May 5, 6 and 7, 1913

The President, Dr. Pearce Bailey, in the Chair

(Continued from p. 663)

Dr. C. Eugene Riggs, St. Paul, Minn., read a paper entitled "Report of a Case of Juvenile Tabes."

Dr. Philip Coombs Knapp, Boston, said that the cases of juvenile tabes were so rare that it seemed permissible to speak of a case now in his wards at the City Hospital which, although not confirmed by autopsy, seemed a case of juvenile tabes. The patient was a girl of 16. Little was learned in regard to her family history. She was the second child, the oldest sister was well, the third child was also well. She had been for the last three years an inmate of the Perkins Institute for the Blind. At the age of five she was run over and injured her head, suffering several scalp wounds and being unconscious for a day. After that there was no trouble at all until about the age of 11, when her sight began to fail. At the age of 12 she had lost vision completely. At that time there was optic atrophy which was assumed to be of traumatic origin. The history otherwise was of comparatively little importance, excepting that for two years she had had much occipital headache, now becoming frontal, and that last September she had an operation for appendicitis, since which time she had had considerable abdominal pain, but no vomiting. There had been a history for a year or two of typical tabetic pains, sharp, shooting pains of brief duration. On examination there was some perception of light and well marked primary atrophy of both optic disks, no indications of any keratitis, no radiating scars about the lips. The two central upper incisors were peculiar in that they were somewhat broad and oval, suggestive but not characteristic of Hutchinson teeth. The knee jerk was absent on one side, obtained only by reinforcement on the other. The ankle jerks were absent. There was no diminution of tonus, no more incoördination than might fairly be expected in a patient who was blind, no disturbance of muscular sense, and slight hyperesthesia about the chest in the distribution of second to sixth dorsal metameres, and slight hypalgesia on right from the fourth to sixth metameres. There was marked Wassermann reaction in the blood and in the cerebrospinal fluid with globulin reaction, but no increased lymphocytosis. There was a slight weakness of the internal and superior recti in the left eye. The pupils were unequal and rigid. There were no mental symptoms.

Dr. Riggs said that he examined the blood serum and spinal fluid and they were both positive. There was no lymphocytosis and no globulin excess.

Dr. H. M. Thomas, of Baltimore, said he would follow Dr. Knapp's example and venture to take a moment of the Association's time to review a case.

The patient, a boy of seven, was admitted to the surgical service of the Johns Hopkins Hospital, where Dr. Thomas saw him in consultation. The patient was supposed to be suffering from a tumor of the cerebellum. The family history, as first taken, was unimportant, except that the mother had had one or two miscarriages. The birth of the child had been normal and he had developed normally; indeed he had been regarded as extremely bright up to his fifth year—a sort of infant phenomenon of the little town in which he lived. After his fifth year he began to deteriorate, when it was noticed that he did not speak as well as formerly, and that he was fretful, noisy, and hard to manage, and that his walk was unsteady. The deterioration progressed very gradually until he received an injury, a few months before he came to the hospital. After this he became rapidly worse; walk was so uncertain that he could hardly get about and he was much changed mentally.

On examination he showed no sign of hereditary syphilis. There was no choked disc, his pupils were unequal, and they did not react to light. The deep reflexes were exaggerated. His walk was unsteady, of the tumbling cerebellar type.

The diagnosis was not clear, and as his parents were with him they also were examined. His father denied venereal infection but admitted frequent exposure. He had himself suffered from lightning pains and on examination revealed undoubted signs of stationary tabes. A Wassermann examination of his blood was negative.

The mother seemed a healthy woman but gave the history of several miscarriages. The physical examination revealed nothing except unequal pupils, the R. being larger than the L. The L. pupil did not react to light but contracted during accommodation. The R. reacted normally. The Wassermann examination of the blood was reported as positive.

The patient's blood also gave a positive Wassermann reaction. At this time a lumbar puncture was not done, as they were still somewhat afraid of cerebellar trouble. The rather indefinite diagnosis of cerebral syphilis was made.

Dr. Howland also saw the patient and directed his treatment in the Harriet Lane Home for children. He was given two doses of neosalvarsan and also mercury and iodide of potassium. He appeared to improve markedly, became more quiet, walked better, and left the hospital in what seemed to be a much better condition. However, before getting home he became very much quieter, spoke very little, and in a week was brought again to the hospital. At this time his condition was markedly changed, he was speechless, took very little interest in his surroundings, and made very little attempt to do anything. He could; however, walk, and his walk was perhaps a little less ataxic than on his former admission. The physical examination was unchanged. At this time a lumbar puncture was done. The blood was under somewhat increased pressure, it contained 33 cells to the mm., gave a positive Wassermann reaction, a positive globulin reaction, and reduced Fehling's solution.

The case then seemed to be one of juvenile general paresis, and this diagnosis was ventured on, although with some trepidation, as Dr. Thomas had never seen a similar case. The diagnosis, however, was concurred in by others. Dr. Howland again treated him vigorously but without avail, and he left the hospital in the same condition.

This case seems to be particularly interesting because of the condition of both father and mother, and because the diagnosis of general paresis was justified at so early an age—seven.

Dr. Smith Ely Jelliffe, New York, said that he thought Dr. Riggs' case afforded a small text for an important topic. Hereditary syphilis was becoming more and more a subject of importance. If the products of the mating of syphilitic parents more often lived the amount of hereditary cerebrospinal syphilis would be so enormous that we should stand aghast at the total. The old formula of no children, dead children, miscarriages, early deaths, would have to be extended to include hereditary paresis, hereditary Freidreich's, large numbers of patients with idiocy, imbecility and hydrocephalics. The creation of this situation has within it certain features worth taking into consideration. It will be recalled that the army and navy have been considered the great spreaders of syphilis throughout the community. In the modern industrial army an analogous situation is arising and the hygienic policing of the soldiers and sailors is diminishing these foci of infection. Yearly a half million industrial workers come to this country and leave it. They usually are men in the prime of life who come by reason of economic conditions. That half million come without their wives and children; they spread throughout the United States as industrial workers. As soon as economic conditions become such that it is more profitable to go to South America or some other place they flock out again. They are the greatest carriers of syphilitic infection. This is one of the most far-reaching factors in the rapid spread of syphilis in the United States and has increased by leaps and bounds in the last twenty years.

Dr. C. Eugene Riggs said that there were just two points on which he would like to elicit comment. First, as to whether this was truly a case of juvenile tabes; secondly, as to whether this hemorrhage or brain disaster was the result of an embolus or a syphilitic endarteritis. The case was interesting and puzzling and he thought worthy of bringing before the Society for discussion.

Dr. Alfred Reginald Allen, Philadelphia, read a paper entitled "Remarks on the Histopathological Changes in the Spinal Cord Due to Impact. An Experimental Study."

Dr. Edward B. Angell, Rochester, N. Y., said there was one question which occurred to him in connection with Dr. Allen's experiments he would like elucidated. The suggestion is made that there is more or less rapid change in the neighboring regions of the spinal cord succeeding this impact. Dr. Angell thought he said within two hours one began to get these changes. Now is it possible that in some of these cases of severe injury to the spine in which we find, in late operations, so-called severance of the cord—the term is used loosely—it does not necessarily mean that the cord is cut in two, or crushed in two; it means rather that there is disintegration of the cord. If that be so, it is quite an important matter. It is possible if we can have an operation within that time, or perhaps within three hours of the reception of the injury, that something might be done to preserve the integrity of the cord. Dr. Angell thought that was the most important point to be gained from the discussion so far as the time of operation in these cases is concerned. He was sorry that Dr. Frazier was not present as he had been called to see an automobile accident in Rochester in which there was disorganization of the cord. He did not operate, as he was called in some days after the accident; but Dr. Angell thought that, if this were so, it should be made rather plain to the surgeon that operation, if done at all, must be done immediately; even by a poor surgeon, as early operation was the only chance.

Dr. E. E. Southard, Boston, said that it seemed to him that this was of great practical interest. He inquired whether there was any evidence in the spinal cord in such way as to show how soon fat was demonstrable by the Marchi method, whether it could be demonstrated in the area of degeneration or outside. Ordinarily we consider that a period of four or five days must elapse before we get a Marchi reaction. There is evidence that the fat demonstrable by the Marchi stain may appear earlier. This question has great theoretical bearing in anaphylaxis.

Dr. Alfred Reginald Allen, Philadelphia, said in answer to Dr. Angell that his question was one of much importance. What is the cause of the destruction of the cord? Is it the direct injury at the time from the impinging of bone on the cord, or is it the destructive effect of the later exudate of blood, serum, etc.? In Dr. Allen's first communication he said that of course if it be the former he was afraid we should not be able to accomplish much. It looks as if it would be necessary for the patient to be operated upon very shortly after the injury in order to obtain satisfactory results. Dr. Allen said he had not been able to get Marchi stain four days after the beginning of the lesion but he thought there was no doubt about the presence of swollen axis cylinders at this period.

Dr. E. E. Southard, Boston, asked whether there were any changes in the swollen myelin sheaths.

Dr. Alfred Reginald Allen said he was not able to say that there had been any change in the swollen myelin sheaths that would make osmic acid change demonstrable.

(*To be continued*)

Translations

MYTH OF THE BIRTH OF THE HERO

BY OTTO RANK, M.D.,

OF VIENNA

TRANSLATED BY DRS. F. ROBBINS AND SMITH ELY JELLIFFE

(Continued from p. 671)

Those who turn aside with horror from this corruption of the child mind, or perhaps actually contest the possibility of such matters, should note that all these apparently hostile imaginings have not such a very bad significance after all, and that the original affection of the child for his parents is still preserved under their thin disguise. The faithlessness and ingratitude on the part of the child are only apparent, for on investigating in detail the most common of these romantic fancies, namely the substitution of both parents, or of the father alone, by more exalted personages—the discovery will be made that these new and highborn parents are invested throughout with the qualities which are derived from real memories of the true lowly parents, so that the child does not actually remove his father but exalts him. *The entire endeavor to replace the real father by a more distinguished one is merely the expression of the child's longing for the vanished happy time, when his father still appeared to be the strongest and greatest man, and the mother seemed the dearest and most beautiful woman.* The child turns away from the father, as he now knows him, to the father in whom he believed in his earlier years, his imagination being in truth only the expression of regret for this happy time having passed away. *Thus the over-valuation of the earliest years of childhood again claims its own in these fancies.*[62] An interesting contribution to this subject is furnished by the study of the dreams. Dream-interpretation teaches that even in later years, in the dreams of the emperor or the empress, these princely persons stand for the father and the mother.[63] Thus the infantile over-valuation of the parents is still preserved in the dream of the normal adult.

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[62] For the idealizing of the parents by the children, compare Maeder's comments (Jahr. f. Psychoanalyse, p. 152, and Centralblatt f. Psychoanalyse, I, p. 51) to Varendouk's essay, "Les idéals d'enfant," Tome VII, 1908.

As we proceed to fit the above features into our scheme, we feel justified in analogizing the ego of the child with the hero of the myth, in view of the unanimous tendency of family romances and hero myths; keeping in mind that the myth throughout reveals an endeavor to get rid of the parents, and that the same wish arises in the phantasies of the individual child at the time when it is trying to establish its personal independence. The ego of the child behaves in this respect like the hero of the myth, and as a matter of fact, the hero should always be interpreted merely as a collective ego, which is equipped with all the excellences. In a similar manner, the hero in personal poetic fiction usually represents the poet himself, or at least one side of his character.

Summarizing the essentials of the hero myth, we find the descent from noble parents, the exposure in a river, and in a box, and the raising by lowly parents; followed in the further evolution of the story by the hero's return to his first parents, with or without punishment meted out to him. It is very evident that the two parent couples of the myth correspond to the real and the imaginary parent couple of the romantic phantasy. Closer inspection reveals the psychological identity of the humble and the noble parents, precisely as in the infantile and neurotic phantasies.

In conformity with the overvaluation of the parents in early childhood, the myth begins with the noble parents, exactly like the romantic phantasy, whereas in reality adults soon adapt themselves to the actual conditions. Thus the phantasy of the family romance is simply realized in the myth, with a bold reversal to the actual conditions. The hostility of the father, and the resulting exposure, accentuate the motive which has caused the ego to indulge in the entire fiction. The fictitious romance is the excuse, as it were, for the hostile feelings which the child harbors against his father, and which in this fiction are projected against the father. The exposure in the myth, therefore, is equivalent to the repudiation or non-recognition in the romantic phantasy. The child simply gets rid of the father in the neurotic romance, while in the myth the father endeavors to lose the child. Rescue and revenge are the natural terminations, as demanded by the essence of the phantasy.

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[63] Dream Interpretation (Traumdeutung), II ed., p. 200. See Brill's Translation, Macmillan & Co., 1913.

In order to establish the full value of this parallelization, as just sketched in its general outlines, it must enable us to interpret certain constantly recurring details of the myth which seem to require a special explanation. This demand would seem to acquire special importance in view of the fact that no satisfactory explanation of these details is forthcoming in the writings of even the most enthusiastic astral mythologists, or natural philosophers. Such details are represented by the regular occurrence of dreams (or oracles), and by the mode of exposure in a box and in the water. These motives do not at first glance seem to permit a psychologic derivation. Fortunately the study of dream-symbolisms permits the elucidation of these elements of the hero-myth. The utilization of the same material in the dreams of healthy persons and neurotics[64] indicates that the exposure in the water signifies no more and no less than the *symbolic expression of birth*. The children come out of the "water."[65] The basket, box or receptacle[66] simply means the container, the womb; so that the exposure directly signifies the process of birth, although it is represented by its opposite.

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[64] Compare the "birth dreams" in Freud's "Traumdeutung" (see Brill's translation, Macmillan & Co., p. 207 et seq.), also the examples quoted by the author in the "Lohengrin saga" (p. 27 et seq.).

[65] In fairy tales, which are adapted to infantile ideation, and especially to the infantile sexual theories (compare Freud in the December number of *Sexual Problems*), the birth of man is frequently represented as a lifting of the child from a well or a lake (Thimme, *l. c.*, p. 157). The story of "Dame Holle's Pond" (Grimm, Deutsche Sagen, I, 7) relates that the newborn children come from her well, whence she brings them forth. The same interpretation is apparently expressed in certain national rites; for example, when a Celt had reason to doubt his paternity, he placed the newborn child on a large shield and put it adrift in the nearest river. If the waves carried it ashore, it was considered as legitimate, but if the child was drowned, this was proof of the contrary and the mother was also put to death (see Franz Helbing, "History of Feminine Infidelity"). Additional ethnological material from folklore has been compiled by the author in his "Lohengrin saga" (p. 20 et seq.).

[66] The "box" in certain myths is represented by the *cave*, which also distinctly symbolizes the womb; aside from statements in Abraham, Ion, and others, especially in case of Zeus, who is born in a cave of the Ida mountains, and nourished by the goat Amalthea, his mother concealing him for fear of her husband, Kronos. According to Homer's Iliad (XVIII, 396, et seq.), Hephaistos is also cast into the water by his mother, on account of his lameness, and remains hidden, for nine years, in a cave surrounded by water. By exchanging the reversal, the birth (the fall into the water) is here plainly represented as the termination of the nine months of the

Those who object to this representation by opposites should remember how often the dream works with the same mechanism (compare "Traumdeutung," II edition, p. 238). A confirmation of this interpretation of the exposure, as taken from the common human symbolism, is furnished by the material itself, in the dream dreamt by the grandfather (or still more convincingly by the mother herself)[67] in the Ktesian version of Kyros before his birth; in this dream, so much water flows from the lap of the expectant mother as to inundate all Asia, like an enormous ocean.[68]

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intrauterine life. More common than the cave birth is the exposure in a box, which is likewise told in the Babylonian Marduk-Tammuz myth, as well as in the Egyptian-Phoenician Osiris-Adonis myth (compare Winckler, "Die Weltanschauung des alten Orients, Ex Oriente Lut," I, 1, p. 43, and Jeremias). Bacchus, according to Paus, III, 24, is also removed from the persecution of the king, through exposure in a chest on the Nile, and is saved at the age of three months by a king's daughter, which is remarkably suggestive of the Moses legend. A similar story is told of Tennes, the son of Kyknos, who has been mentioned in another connection (Liceke: Hermes, p. 48, annotation), and of many others.

The occurrence of the same symbolic representation among the aborigines is illustrated by the following examples: Stucken relates the New Zealand tale of the Polynesian Fire (and Seed) Robber, Mani-tiki-tiki, who is exposed directly after his birth, his mother throwing him into the sea, wrapped in an apron (chest, box). A similar story is reported by Frobenius (*loc. cit.*, p. 379) from Betsimisaraka, where the child is exposed on the water, and is found and raised by a rich childless woman, but finally resolves to discover his actual parents. According to a report of Bab (*Zeitschrift für Ethnologie,* 1906, p. 281) the wife of the Raja Besurjaj was presented with a child floating on a bubble of water-foam (from Singapore).

[67] In the above mentioned work of Abraham, "Dreams and Myths," pp. 22, 23, English translation, Monograph Series, No. 15, contains the analysis of a very similar although more complicated birth dream, corresponding to the actual conditions; the dreamer, a young pregnant woman, who was awaiting her delivery, not without fear, dreamed of the birth of her son, and the water appeared directly as the amniotic fluid.

[68] This phantasy of an enormous water is extremely suggestive of the large and widespread group of the Flood Myths, which actually seem to be no more than the universal expression of the exposure myth. The hero is here represented by humanity at large. The wrathful father is the god; the destruction as well as the rescue of humanity likewise follow one another in immediate succession. In this parallelization, it is of interest to note that the ark, or pitched house, in which Noah floats upon the water is designated in the Old Testament by the same word (*tebah*) as the receptacle in which the infant Moses is exposed (*Jeremias*). For the motive of the great flood, compare Jermias, and Lessmann, at the close of his treatise on the Kyros saga, in Europe, where the flood is described as a possible digression of the exposure in the water. A transition instance is illustrated by the flood saga told by Bader, in his Badensian folk legends. When the Sunken Valley was inundated once upon a time by a cloudburst, a little boy was seen floating upon the waters in a cradle, who was miraculously saved by a cat (Gustav Friedrichs).

It is remarkable that in both cases the Chaldeans correctly interpreted these water dreams as birth-dreams. In all probability, these dreams themselves are constructed out of the knowledge of a very ancient and universally understood symbolism, with a dim foresight of the relations and connections which are appreciated and presented in Freud's teachings. There he says ("Traumdeutung," 2d edition, p. 199) in referring to a dream in which the dreamer hurls herself in the dark water of a lake: Dreams of this sort are birth-dreams, and their interpretation is accomplished by reversing the fact as communicated in the manifest dream; namely, instead of hurling oneself into the water, it means emerging from the water, *i. e.,* to be born.[69] The justice of this interpretation, which renders the water-dream equivalent to the exposure, is again confirmed by the fact that precisely in the Kyros saga, which contains the water-dream, the motive of the exposure in the water is lacking, while only the basket, which does not occur in the dream, plays a part in the exposure.

In this interpretation of the exposure as the birth, we must not let ourselves be disturbed by the discrepancy in the succession of the individual elements of the symbolized materialization, with the real birth process. This chronological rearrangement or even reversal has been explained by Freud as due to the general manner in which recollections are elaborated into phantasies; the same material reappears in the phantasies, but in an entirely novel arrangement, and no attention whatsoever is paid to the natural sequence of the acts.[70]

The author has endeavored to explain the psychological relations between the exposure-myths, the flood legend, and the devouring myth, in his article on the "Overlying Symbols in Dream Awakening, and Their Recurrence in Mythical Ideation" ("Die Symbolschichtung in Wecktraum und ihre Wiederkehr im mythischen Denken" (*Jahrbuch für Psychoanalyse,* V, 1912).

[69] Compare the same reversal of the meanings in Winckler's interpretation of the etymology of the name of Moses (p. 13).

[70] The same conditions remain in the formation of dreams and in the transformation of hysterical phantasies into seizures (compare "Traumdeutung," p. 238, and the annotation in the same place, also, Freud, "Allgemeines über den hysterischen Anfall" ("General Remarks on Hysterical Seizures") in *Sammlung kleiner Schriften zur Neurosenlehre,* 2 Series, p. 146 et seq.

(*To be continued*)

Periscope

American Journal of Insanity

(Vol. LXX, 1913, No. 1)

1. Dissimilar Heredity in Mental Disease. A. J. ROSANOFF.
2. Statistical Studies in Syphilis with the Wassermann Reaction. F. S. HAMMOND.
3. Insanity and Race. H. M. SWIFT.
4. Further Observations on the Blood in Pellagra. J. C. BARDIN.
5. Prison Psychoses. A Pseudonym. PAUL E. BOWERS.
6. Present Status of Pathological Histology of the Cortex. A. ALZHEIMER.
7. Proceedings of American Medico-Psychological Association.

1. *Dissimilar Heredity in Mental Disease.*—While European studies on the heredity of insanity have been carried out mainly with reference to general biological laws, in America students of this subject have availed themselves quite freely of the data of experimental biology, which are far more complete. Not being entirely satisfied with the material upon which his previous studies with Orr were based, since a large part of it had not been personally observed, the author in this article makes use of the extensive material of the Kings Park State Hospital, in a further attempt to answer the following questions: (1) "What is the relationship existing between the various forms of mental disease which occur upon a hereditary basis?" (2) "In cases classed clinically under a common heading what conditions determine the particular symptoms and gravity of the course?" Cases differ from each other qualitatively and quantitatively, the first term having to do with the differences which give a basis for classification into groups, the second with the degree or amount of mental defect.

The material used consists in the main of closely related persons who are, or have been, patients in the Kings Park State Hospital. Under qualitative dissimilarity he considers the hereditary relationships of epilepsy, the hereditary relationships of manic depressive insanity, of involutional melancholia, of dementia præcox, then attempts a classification upon a hereditary basis. Under quantitative dissimilarity he considers the manifestations of manic depressive insanity and dementia præcox, then discusses the subject as related to psychoses in general. No other circumstance he thinks has so greatly served to warp our conceptions of psychoses as the fact that attention has heretofore been concentrated almost exclusively upon asylum material. The history of the hereditary relationships of insanity will have to be largely studied outside of asylums, since it has been estimated that only one fifth of those who have neuropathic symptoms at some time or other in their lives are ever subject to commitment as insane. There is only asylum evidence for the view that manic depressive insanity runs its course in attacks having either manic, melancholic, or mixed character, nor is the idea that dementia præcox is "a series of clinical pictures the common characteristic of which consists in their termination in a peculiar form of mental weakness" based on any other evidence. In other words some of the traits of either of these diseases would probably be found in a large number of people whose sanity never comes into question, if we looked for them. In a final section the author discusses the subjects of normal temperaments, mental vigor, feeblemindedness and eugenics. He gives short histories of those cases which are relations, side by side, so that the reader may compare them trait by trait. He summarizes as follows:

"A hereditary relationship exists between various neuropathic conditions which are clinically sharply distinguished from one another. The following conditions may be mentioned as being thus related: epilepsy, dementia præcox, manic depressive insanity, imbecility, involutional melancholia, paranoic conditions, acute hallucinosis (alcoholic), and some allied psychoses." These neuropathic conditions possess in common the property of behaving as recessive traits, in the Mendelian sense, in relation to the normal condition. The relationship which they bear to one another seems to be analogous to that of coat colors in mice or other such cases known to biology, so that it appears possible to construct for the better known psychoses a similar scale of dominance. "The material that would be required for a definite assignment of a position for each clinical variety in the scale of dominance is to-day hardly available. That which is at hand, however, seems to suggest the following arrangement: *NMDE*." *N* represents the "normal" mental factor (the factor which makes for mental stability), *M* the manic depressive factor, *D* the dementia præcox factor, and *E* the epileptic factor. In the same clinical groups, there are very wide quantitative variations with regard to psychotic manifestations; and the actual variations are probably far wider than would be indicated by asylum cases alone, especially as regards mildness. "As to the causes and nature of such variations, exogenous factors are probably of comparatively minor importance, the amount and kind of psychotic disturbance being mainly predetermined in the germ plasma. Many cases show mixtures of symptoms belonging to different clinical groups." These probably constitute true transition forms dependent upon minus variations of epistatic factors with resulting imperfection of dominance. "It is suggested that quantitative variations beyond the limits observed in asylum cases on the one hand, and imperfection of dominance affecting the normal mental factor on the other, may be the conditions underlying some of the milder neuropathic manifestations, and possibly even certain normal mental traits." At least there is ample evidence to show that healthy and efficient mentality is by no means determined solely by the "normal" mental factor; this factor might be termed preferably the factor of mental stability.

"Mental vigor appears to be dependent upon the potency and quantity and not on the variety of the mental determiners. Individuals belonging to any of the groups here considered—mentally stable, manic depressive, dementia præcox and epileptic—may be feebleminded, but the chances of their being so increases with descent in the scale of dominance. . . . The relationship of feeblemindedness to other neuropathic conditions and to the 'normal' condition thus becomes simply that of a heterogeneous group of minus variants dependent upon a general deficiency in the potency or quantity of all mental determiners. Feebleminded subjects, like subjects presenting average or high mental vigor, may be mentally stable, or liable to attacks of excitement or depression, they may develop catatonic or paranoid symptoms leading to deterioration, or they may have epileptic seizures. The distinction between 'normal' and 'neuropathic' constitutions apparently does not coincide with that between health and disease." These terms have arisen from the fact that psychiatric studies have heretofore been carried out almost exclusively upon asylum material, and it would be well to drop them in this connection if it were possible, and with them the notion that but one variety of "germ-plasmic mental factors" is socially desirable. This abstract gives but a brief outline of this comprehensive paper. It should be studied in the original by those specially interested in the subject.

2. *Statistical Studies in Syphilis with the Wassermann Reaction.*—The author used as material for his studies all the patients who were in the New Jersey State Hospital at Trenton, from May, 1911, to June, 1912, to the number of 1,583. Both the Wassermann and the Noguchi tests were used, the original technique being adhered to with the exception that alcoholic extract of syphilitic fetal liver was used instead of the Wassermann watery extract and the Noguchi acetone insoluble lipoids. "Only inactivated sera were tested and 2 units of hemolytic amboceptor were used in both procedures." 1,909 reactions were performed, 1,769 on blood, 140 on spinal fluid. This includes 186 repeated reactions on the serum and 24 on the fluid. The spinal fluid tests were made after Wassermann alone, as it was found that in the Noguchi method the alcoholic liver extract brought about rapid hemolysis of the human cells. Considering the serum reactions alone, there were 1,047 by Noguchi, 503 by Wassermann, 219 by both; these included 70 cases of general paresis and gave as a first result 104 positive reactions, 42 doubtful, and 1,613 negative. Of the 104 positive sera, 61 were from cases of paresis and 43 were in patients presenting no parasyphilitic manifestations. All of these 104 sera reacted positively by Noguchi, only 97 by Wassermann. Of the 42 presenting doubtful reactions on first testing, 36 reacted negative later, by both methods the other 6 upon retesting were positive. Of 7 sera which gave contradictory reactions by the two methods (positive by Noguchi, negative by Wassermann), five were from cases of general paresis of undoubted clinical symptoms, showing pleocytosis and excessive globulin in the spinal fluid, two from individuals without evidence of syphilitic disorder. On further investigation the sera from the five paretics continued definitely positive by Noguchi, negative by Wassermann. The author thinks that the Wassermann gives somewhat too low, the Noguchi slightly too high figures. In the 70 cases of general paralysis, the serum reacted positively in 87.14 per cent. of cases, the spinal fluid in 80.7 per cent. There was a pretty general coincidence of pleocytosis and positive compliment fixation in the spinal fluid. The author found, however, that in some of his cases the cell count was first low and at a later examination above the normal, hence he suggests that since it does not appear that Plaut in some work published by him made a cell count on more than one occasion, the conclusions drawn by this author that positive serum reaction and pleocytosis do not necessarily correspond, need to be reconsidered and tested by repeating the examinations on the some patients from time to time. His total figures for the hospital population are: 102 positive and 1,481 negative reactions, or a percentage of 6.3. There were 41 positive reactions in cases not paralytic, 2.7 per cent., while in the paralytic cases the percentage was, as already stated, 87.15. Proceeding to the comparison of the percentages of positive reactions in nonparalytic cases, in patients from the eight counties of the hospital district, he finds them to vary from 8 per cent. in Camden Co. (city of Camden, opposite Philadelphia), nearly 100,000 inhabitants, and 4.83 per cent. for Mercer Co. (city of Trenton, 100,000), down to 0.0 per cent. for the Ocean Co. (sparsely settled, no large towns). The average figures are 5.4 per cent. for the counties with large cities, 2.3 per cent. for

the counties with no large cities. This bears out the general idea that syphilis is more frequent in urban than in rural communities. In the non-paralytic cases the males represented 3.87 per cent., the females 1.65 per cent. of the positive reactions. The foreign born gave 1.46 per cent., the native whites 2.94 per cent. and the negroes 5.95 per cent. As to the conditions other than paresis in which there were positive reactions, organic neurological conditions gave 12.5 per cent., arteriosclerotic brain disease 8.76 per cent., alcohol psychoses and drug addictions 5.45 per cent., paranoid conditions 3.92 per cent., imbecility and idiocy 3.09 per cent., dementia præcox 2.36 per cent., constitutional inferiority 2 per cent., senile dementia 1.98 per cent., manic depressive insanity 1.47 per cent., epilepsy, toxic exhaustive psychoses and psychoneuroses 0.0 per cent.

Considering the reactions by age, it is found that they rise in general to their maximum in the fifth decade as does also general paresis. As a contribution to the long persistence of positive reaction he analyzes 1,513 cases of his series and finds that in no less than nine who had been in the hospital for from 13 to 25 years a positive result was obtained and touches upon the questions of what is the actual condition in these patients and in the non-insane outside of hospitals, what should be done with them, without, however, attempting to answer them. The general figures for the non-paralytic asylum population correspond to those for the population of the state at large. In only one form of psychosis besides general paresis and brain syphilis did he find that syphilis played a rôle. "This is the type of focal brain disorder which occurs in middle life as a result of vascular sclerosis. This group was found to constitute 16 per cent. of all the arteriosclerotic mental disorders among men and, although not symptomatically differentiated from other similar focal brain diseases, has an entirely different etiology which may be demonstrated by biological methods."

3. *Insanity and Race.*—The author attempts to compare the relative frequency of insanity among a few of the nationalities or races most prominently represented in Massachusetts, as shown by admissions to the State insane hospitals. He first compares the frequency of insanity in general among different nationalities as compared to the whole number of people of the corresponding nationality in the State and second the relative frequency of the commoner psychoses in the different groups He freely acknowledges that on account of various difficulties his results cannot be more than approximate, but thinks that they nevertheless have some value. Also he is of the opinion that the relative frequency of insanity among the various races in America cannot be assumed as necessarily a true indicator of race susceptibility in the mother countries, since change of environment may have modifying effects. While the foreign born in 1905 comprised 30.56 per cent. of the population of the State, they furnished 44.29 per cent. of the first admissions to the State hospitals. In 1910 the figures were 31.2 per cent. and 44.7 per cent. The native born of native parents in 1905, while comprising 39.83 per cent. of the population, furnished 31.43 per cent. first admissions, and in 1910, while 32.8 per cent. of the population, 31.3 per cent. first admissions. The author gives in tabular form statements of the relative frequency of the different psychoses among natives of the United States, Ireland, Canada (English and French Canadians separately), England, Russia (almost exclusively Jews), Germany, Scandinavia, Italy, Poland and miscellaneous. From his analyses he concludes . . . That among the Irish the rate of insanity is higher than in any other of the races studied, this being mainly on account of greater

susceptibility to alcoholism. Among the Italians and French Canadians the figures are comparatively low. Among the Hebrews the frequency of insanity is moderate, and it consists mainly of constitutional psychoses, alcoholic conditions being extremely rare. In general insanity is more frequent relatively among the population of foreign birth and parentage, and immigration must be considered as one of the potent factors in filling our asylums.

4. *Further Observations on the Blood in Pellagra.*—In a previous number of this JOURNAL the author gave the results of his examinations of the blood in seven cases of pellagra, all negroes. He at that time found that in uncomplicated pellagra the differential leucocyte count showed a diminution of polymorphonuclear neutro- and basophiles, a rather marked increase in small lymphocytes, some increase in large lymphocytes, and usually a diminution of eosinophiles. In cases complicated by tuberculosis, on the other hand, the polymorphonuclear neutro- and basophiles were high, the small lymphocytes normal, or slightly below, the large lymphocytes were increased, and the eosinophiles markedly diminished. In this paper he reports seven more cases in which practically the same results were obtained. Three cases of this last series were infested with lumbricoid worms and tricocephalus dispar and two of these also had strongyloides intestinalis. These three cases showed marked eosinophilia, which, however, did not affect the lymphocyte count. The lymphocytes he finds the chief blood unit affected in pellagra and thinks that the small lymphocytes increase in proportion to the severity of the skin lesion.

5. *Prison Psychoses. A Pseudonym.*—Considering the question as to whether there are any definite prison psychoses, the author, who is physician in charge of the Indiana State prison, answers it strongly in the negative. The state prison of to-day he finds a place in which the hygienic conditions are usually good and the treatment of the prisoners is humane, so unlikely to serve as a cause of the outbreak of psychoses. As far as remorse for crime is concerned, he finds it a great rarity among the class of people who are there detained. The insane among our prison population he divides into two classes: (1) Those who are insane at the time of admission and whose mental disorders have been overlooked by the authorities, making up about 5 per cent. of those sentenced, and among whom he finds cases of senile and arteriosclerotic dementia, general paresis, paranoia, epilepsy, and dementia præcox; (2) those who are potentially insane but have escaped close observation in the outside world and only exhibit their latent organic defects and active psychoses under the close scrutiny of prison life. Many of these last may be considered as candidates prepared for mental disease and episodic exacerbations unnoticed outside are here detected and labelled "prison psychoses." These are the majority of our insane criminals. The insane criminals are chiefly recruited from the ranks of the recidivists, who do not suffer mentally, since their intellectual processes are below par and their moral and ethical senses are poorly developed or blunted. The accidental criminal and criminal by passion who are capable of mental distress, and in whom psychogenetic factors might be assumed to be operative, are, in the author's experience, not the ones who become insane. Recoveries among prisoners are rare, since they are developed on fertile and degenerative soil. While there is no true prison psychosis, the essential insanities may in prison take on a certain coloring, mainly a paranoid one, under the influence of prison life.

6. *Pathological Histology of the Cortex in the Psychoses.*—This article

was originally published in the *Zeitschrift für die gesammte Neurologie und Psychiatrie*, 1912, Band V, Heft 8, and will be found in the periscope under abstracts from this journal.

7. *Proceedings of the American Medico-Psychological Association.*—LXIX Annual Meeting, 1913.

8. *Have We a Specialty?* (Presidential Address, American Medico-Psychological Association, LXIX Annual Meeting.)—A general consideration of the scope of psychiatry and a review of the different branches of science in which it is necessary to be proficient in order to successfully practice this, in the author's opinion, the most comprehensive of specialties.

C. L. Allen (Los Angeles).

Revue Neurologique

(Vol. XXI, No. 1, Jan. 15, 1913)

1. New Researches and Observations Concerning the Relations Existing between the Vestibular Apparatus and the Central Nervous System. Cerebellar and Vestibular Symptoms Caused by Tumors in the Cerebrum. R. Barany.
2. Anatomical Study of a Case of Hemianesthesia Due to a Lesion in the Anterior Part of the Optic Thalamus. L. Bériel.

1. *Relation between the Vestibular Apparatus and the Nervous System.*—Staggering or spontaneous nystagmus may be present in tumors of the cerebrum and in order to distinguish them from tumors of the cerebellum a minute functional examination is necessary, caloric nystagmus tests, etc. It is necessary to examine the patient several times; if the phenomena are transient, or markedly influenced by lumbar puncture or decompressive operation, the lesion is probably cerebral and not cerebellar. The caloric reaction is never completely abolished in brain tumor save by tumor of the auditory nerve. A case is reported in which there was frontal headache, vomiting, vertigo and tinnitus, with a detailed account of the vestibular reactions. Autopsy showed a caseated tubercle in the right frontal lobe.

2. *Hemianesthesia with Lesion in the Anterior Part of the Optic Thalamus.*—The observation concerns a patient aged 80 years who, after a slight stroke, presented a right hemiparesis and hemianesthesia to touch and pain. The sensory disturbance was more marked than the motor. Necropsy, fourteen days later, showed a destructive lesion exclusively in the anterior part of the optic thalamus.

(Vol. XXI, No. 2, Jan. 30, 1913)

1. A Case of Friedreich's Disease with Autopsy. Lambrior.

1. *Friedreich's Disease.*—No signs of syphilis were present. This case demonstrates that the fundamental lesions in Friedreich's disease are the degenerations in the posterior columns, the posterior roots, Clarke's columns and the peripheral nerves. The degeneration in the crossed pyramidal tracts, Gowers' tract and the direct cerebellar tract is "variable and contingent."

(Vol. XXI, No. 3, Feb. 15, 1913)

1. The Sign of Negro in Peripheral Facial Palsy. A. DE CASTRO.
2. The Evolution of Pupillary Disturbances in Tabetics. A ROCHON-DUVIGNEAUD AND JEAN HEITZ.

1. *Sign of Negro.*—When the patient with peripheral facial palsy looks upward the eyeball on the paralyzed side rotates upward more than the one on the normal side. This is due to an overinnervation of the superior rectus on the paralyzed side. The sign is not present in cases of paralysis of central origin.

2. *Evolution of Pupillary Disturbances in Tabetics.*—In 1903, the authors published the results of an examination of the pupils in 77 cases of tabes. Seven years later they examined the pupils of 16 of these cases under identical conditions. They conclude that: The diameter of the pupil has a slight tendency to increase especially in those patients with optic atrophy; when the contour of the pupil is deformed it remains so; when the reflex in light does not disappear in the initial period it persists indefinitely and the same peculiarity is noticed in the reflex to convergence. These patients had no active treatment during this period and their general condition remained stationary.

(Vol. XXI, No. 4, Feb. 28, 1913)

1. Do There Exist, Properly Speaking, Motor Images of Articulation? J. FROMENT AND O. MONOD.
2. Microscopic Technique. Bielchowsky Method Simplified by Rapid Impregnation. A. SHUNDA.

1. *Motor Images of Articulation.*—In conclusion, the authors find that the motor images of articulation are not open to psychological investigation as are visual or auditory images; it is an hypothesis which is not necessary to explain the mechanism of articulate language. Articulation, like writing, is conditioned by simple motor habits and these habits are energized directly, and without the intervention of any conscious memory, by the sensory images with which they are regularly associated; when the volition does not intervene to inhibit these automatic motor acts the sensory images tend to externalize themselves as is seen in strong emotion for example.

2. *Simplified Bielchowsky Method.*—Staining can be completed in an hour, but the proceeding is not fully described.

(Vol. XXI, No. 5, March 15, 1913)

1. A Reflex Phenomenon of the Upper Limb: the Forearm Sign. A. LERI.
2. A Sign of Organic Paralysis: Flexion of the Knee. NOICA AND PAULIAN.
3. The Phenomena of the Extension of the Fingers, Normal and Pathologic. C. PASTINE.

1. *The Forearm Sign.*—The subject is instructed to completely relax the upper extremity to be examined, which is then grasped by the examiner in the neighborhood of the wrist by the left hand while with his right hand he flexes the fingers on the hand and the hand on the wrist, using

a little force; at the same time it will be noticed that the forearm is progressively flexed as if under the influence of an elastic traction. The sign is said to be positive when this flexion occurs, negative when it does not. The sign is negative on the paralyzed side in hemiplegics, and in certain other organic diseases of the nervous system.

2. *Flexion of the Knee.*—When a person lying in the ordinary dorsal position is asked to elevate the leg there is usually a slight flexion at the knee, but when attention is called to it the leg can be raised in full extension. In cases of organic hemiplegia or paraplegia the leg can only be raised, if at all, with flexion of the knee.

3. *Extension of the Fingers.*—This sign, described by Alfred Gordon as occurring only in cases of paralysis of cerebral origin, is found also in normal individuals.

(Vol. XXI, No. 6, March 30, 1913)

1. Trophic Disturbances of Traumatic Origin; Atrophy of the Hand with Decalcification of the Bones Following a Fracture of the First Phalange of the Little Finger. André-Thomas and H. Lebon.
2. A Benign Case of Pneumococcic Meningitis, Clinically Primary. R. Ducastaing.

1. *Trophic Disturbance of Traumatic Origin.*—After a severe blow on the little finger it became painful and swollen, but the patient continued to use the hand, until five weeks later the whole hand was the seat of intense pain and was useless. Examination showed that the left hand was somewhat smaller than the right, the fingers fusiform and the articular folds smoothed out. An X-ray showed the decalcification of the bones of the hand, wrist and of the lower ends of the radius and ulna. The tendon reflexes were normal in the upper extremity, the nerve trunks not especially tender to pressure and there was no reaction of degeneration in the muscles. The author ascribes the trophic changes to some reflex origin.

2. *Pneumococcic Meningitis.*—The symptoms began suddenly: headache, fever, vomiting, pain in the back, rapid and dichrotic pulse, rigidity of the neck and Kernig's sign. On the fourth day of the disease all these symptoms had disappeared and there followed an eruption of herpes labialis. The spinal fluid gave a positive culture of pneumococci.

C. D. Camp (Ann Arbor).

Archiv für Psychiatrie und Nervenkrankheiten

(50. Band, 2. Heft)

11. The Cerebro-cerebellar Tracts. Carlo Besta.
12. Spinal Gliosis and Syringomyelia. E. Siemerling.
13. Early Symptoms of Arteriosclerotic Brain Disease. Raecke.
14. Spinal Cord Degenerations in Pernicious Anemia. Rudolf O. Lenel.
15. Absence of Corpus Callosum in the Human Brain. W. Stoecker.
16. The Adrenalin Content of the Blood in Certain Psychoses. Max Kastan.
17. The White Blood Cells in the Insanity of Youth. O. Pförtner.

11. *The Cerebro-cerebellar Tracts.*—Besta has undertaken an experimental investigation of the cerebro-cerebellar tracts, the experimental ani-

mals being dogs and cats. The anatomical details of this exhaustive paper cannot be given in the scope of a brief review. In drawing his conclusions, the author wisely remarks that his findings on the course of these tracts must not be given too wide significance, since the study has been made only upon lower animals. The possibility is suggested that in the higher development of the brain,—the cerebellum in man,—it is entirely possible that association tracts occur which do not exist in the lower mammals. The writer warns against the mistake not infrequently made of applying to man anatomical conclusions based on a study of lower animals.

12. *Spinal Gliosis and Syringomyelia.*—Siemerling, on the basis of a carefully studied case in which there was an involvement of the cervical cord with destruction of the posterior tracts and retained pupillary reactions, discusses the problem of spinal gliosis and syringomyelia. Evidence is brought by the case that the hypothesis of a center for the pupillary reflex does not exist in the upper part of the spinal cord. Anatomically, the case presented a glioma together with the gliosis and cavity formation, the two conditions running into each other without sharp boundaries. The case is of interest as a careful anatomical and clinical study from which naturally too wide conclusions should not be drawn.

13. *Arteriosclerotic Brain Disease.*—The attempt is made in this paper to develop a symptom complex which may be regarded as indicative of arteriosclerotic brain disease. The question of differential diagnosis is discussed at length, and the difficulties incident to a determination of actual vascular changes are contrasted with other conditions, both of a functional and structural sort. In early stages, the difficulty of distinguishing the nervous and mental symptoms of brain arterial disease from the manifestations of hysteria and neurasthenia and similar conditions, is great in the absence of focal symptoms of a somatic sort. Likewise, whether brain arteriosclerosis is to remain stationary or to go over into the severer progressive form, is to be determined essentially by the development of somatic focal symptoms. As it is unjustifiable to make a diagnosis of progressive paralysis purely on the basis of mental symptoms, so also is it essential for the proper recognition and prognosis of arteriosclerotic disease to devote special attention to the neurological findings. An extensive bibliography of 237 references is appended to this article.

14. *Spinal Cord Degeneration in Pernicious Anemia.*—Lenel takes up again the much discussed subject of spinal cord degenerations in pernicious anemia, reviewing briefly the literature, and offering a case studied by various methods as the basis of his report. The author apparently reaches no definite conclusions of his own, but quotes again the various theories which have been advanced from time to time to explain this peculiar and characteristic degeneration. In this connection, he refers to the vascular theory, and to the theory of a toxine; the point of importance, however, as to why such a hypothetical toxine should select certain portions of the spinal cord, remains unanswered. The paper adds but little to our knowledge of the subject.

15. *Absence of Corpus Callosum.*—Although this defect has often been described, Stoecker considers that a detailed description of another case is justified, particularly since he is able to offer a thoroughgoing anatomical description on the basis of a series of brain sections. Few of the cases hitherto reported have been accompanied by such anatomical demonstration. His case was that of an 18-year-old juvenile paralytic whose brain showed an absence of the corpus callosum. The clinical history having

been elsewhere and previously given, the writer devotes himself to the pathological findings. Among other points of interest, it was found that the fornix did not unite in the middle line as is usually the case, but remained separate; that a septum pellucidum did not exist; that an anterior commissure was definitely present and apparently normal; that the convolutions and fissures, both on the mesial surface as well as on the convexity, showed certain changes from the normal, in which the anatomical findings were similar to those in previously described cases. Certain interesting deductions are drawn regarding the course of the fibers in the corpus callosum and the adjoining hemispheres.

16. *Adrenal Content of the Blood.*—On the basis of seventeen cases, Kastan seeks to investigate the adrenalin content of the blood in certain psychoses of the general character of imbecility and idiocy. In 11 of the 17 cases of this type there was a considerable diminution in the amount of adrenalin in the blood; in three a very great diminution; and in three only did it reach the normal. In four other cases, the study was made in senile psychoses. In two of these cases, no alteration in the normal amount of adrenalin was found; and in the remaining two, a like condition was probably present. Certain deductions regarding the relation of hereditary influences to idiocy are discussed in connection with the existence of adrenalin.

17. *White Blood Cells in Insanity of Youth.*—Pförtner reports two cases of psychoses in young persons with reference to the white blood corpuscles. He concludes that the hyperleukocytosis found in these cases, and particularly the great increase of neurophils, is to be regarded as a protective reflex of the organism against toxic influences set free through disease. Inasmuch as the delirious conditions characteristic of mental disturbance of youth must be regarded as due to an accumulation of toxines, the blood finding is to be expected. The occurrence of the various types of leukocytes is also considered by the writer. The question of the cause of the toxines in these cases is not discussed, although it is considered as established that such toxic material is present in the blood. A further study may make possible a more rational therapy of these conditions.

E. W. TAYLOR (Boston, Mass.).

Monatsschrift für Psychiatrie und Neurologie

(Vol 32, No. 4)

1. Myotonic Reaction (Myographic Studies). F. KRAMER AND L. SELLING.
2. The Significance of the Bulbar Lesion in Syringomyelia for the Sensory Defect-Symptoms. B. BROUWER.
3. Sub-cortical Motor Aphasia—with Some General Remarks on the Interpretation of Aphasic Symptoms. G. STERTZ.

1. *Myotonia.*—A recording apparatus was arranged on the foot and tracings made of the contractions in response to various electrical currents. The explanations of the various phenomena are discussed at length. The prolonged contraction of the muscle after the application of any excitant is explained by Nernst as due to a loss of accommodation power in the muscle. Jensen's theory that the contraction is kept up by the assimilation processes which replace the excited state, seems more acceptable. Jensen also found that the period of contraction was lengthened by cold and made shorter by heat. This probably explains why, after

repeated stimulation, the duration of the contraction grows less. The heat produced by the contractions has the effect of reducing the period of excitability. The continued contraction during the application of a galvanic current, the failure of the opening contraction, the increased excitability and the displacement of the excitable points, are the chief features.

2. *Syringomyelia.*—Through a well-observed and anatomically carefully studied case the author endeavors to contribute to our knowledge of the part played by the bulbar lesion in producing the sensory symptoms in syringomyelia. Bosch has offered the hypothesis that the sensory dissociation is not to be explained by the spinal lesions but by the defects in the medulla oblongata. The author disproves most of Bosch's arguments but concurs partially in one, namely that the sensibility disturbance in advanced cases is a complicated one. In the first place, the disorder in touch sense which always shows a tendency to be greater on one side, also the disorder of pain, temperature and touch sense in the face of the same side, are due to the bulbar lesion. In the second place the disturbance of pain and temperature is due to destruction of the posterior-horn cells and the fibers from them which lie near the central canal. For an accurate study of the disease on the basis of the segmental anatomy of the cord and brain-stem only early cases are suitable.

3. *Aphasia.*—The case which forms the basis of the article was that of a man of 48, who, after having suffered for six years with tabes dorsalis, developed general paralysis. In spite of the existence of the latter disease he retained a relatively clear intellectual state for some time. It was thus possible to make a careful examination of the aphasic condition which he exhibited and which may be briefly summarized as follows: Spontaneous speech was fluent without motor disorder and almost entirely free from paraphasia. Repetition of spoken words was limited to one syllable or the first one or two syllables of polysyllabic words. Writing to dictation showed the same disturbance. Spontaneous writing, copying, reading and understanding of written words were well preserved. He was usually able to name objects, obey simple commands and add figures. Autopsy showed well-marked paretic changes. The inflammatory alterations were predominant in the frontal lobes but the degenerative changes were far more prominent in the temporal and central gyri. Here there was pronounced loss of nerve fibers and areas of nerve cell destruction, the latter involved in the temporal lobes, principally the third cell layer. During recent years we have had to alter our conception of subcortical sensory aphasia or "pure word-deafness." Absolutely "pure" cases probably do not occur. A certain amount of cortical involvement is to be expected. Blosen points out the probability that what we regard as cortical and subcortical aphasias are but different degrees of intensity of the same process. We also have come to know that the disorder does not have to be total, as earlier held by Liepmann and Wernicke. For the treatment of this question the author believes we must distinguish between word-sound understanding and word-sense understanding. The patient in question quite frequently understood words when he could not pronounce them. On the other hand his comprehension of sentences was only apparent. It was easy to demonstrate that he understood only occasional words and "guessed at" the remainder. After a general discussion of localization of sensory aphasia it is concluded that the patient's aphasia was produced by "an elective, systematic disease of those association tracts which connect the acoustic end-station with the neighboring cortical regions in which are stored sound and word images."

(Vol. 32, No. 5. November, 1912)

1. The Clinical Position of the So-Called "Genuine" Epilepsy. O. Binswanger.
2. The Differential Diagnosis between Cerebral Vascular Disease and Brain Tumor. K. Bonhoeffer.
3. Pseudotetanus Myxœdematoides. G. Söderbergh.
4. Remissions in Progressive Paralysis. P. Schröder.

1. *Epilepsy.*—Is genuine idiopathic epilepsy to be still regarded as a neurosis or may we class it with the organic cerebral disorders? Heilbronner, who is the most active adherer to the latter theory, believes epilepsy to be due to a specific progressive process in the brain. If this be true, epilepsy must be regarded as a "progressive" disease. But what is then to be said of cases in which after years there is no apparent dementia and with the occasional cases of spontaneous recovery from epilepsy? B. has personally seen 25 such cases in which epileptic seizures had been present at least two years and then ceased. B. disagrees with Heilbronner that the gliosis so frequently found and so ably studied by Alzheimer is the cause of the progressive course of the disease independently of the seizures. As Alzheimer has pointed out, the seizures undoubtedly produce destruction of nerve tissue and the gliosis is simply the usual reaction to such process. The cases in which the cornu ammonis is sclerosed must be classed with the organic and not with the "genuine" epilepsy. There is nothing in the clinical or anatomical features to support the hypothesis at present that epilepsy is an organic disease of the brain. The term "genuine" is misleading and apt to be construed as "congenital." "True" epilepsy is a better name.

2. *Cerebral Vascular Disease and Brain Tumor.*—A woman of 40 presented a series of symptoms which pointed almost certainly to brain tumor. She was operated upon with fatal result and autopsy showed no tumor. There was a severe grade of arteriosclerosis and softenings in both frontal lobes, both lenticular nuclei and left thalamus. Two other cases which presented clinical pictures which scarcely left room for doubt that brain tumor existed, recovered completely from the very ominous symptoms and the diagnosis of arterial thrombosis seemed to be necessitated. The points by which these cases might have been correctly diagnosed are reviewed together with the probable reason for their simulating tumor. The discussion is very instructive but could be reviewed only by giving the cases in extenso.

3. *Pseudotetanus.*—The symptomatology of pseudotetanus as described by Escherich is reviewed and the history of the author's own case is given with illustrations. Tetanic symptoms developed in a girl of 11 years and gradually increased until it was necessary to take her to a hospital. There she was found to have a permanent contraction of nearly all the muscles of her body and occasional spasmodic attacks with opisthotonus. There was partial ankylosis of the left elbow from induration surrounding an old injury. The hair was dry and stiff, the skin dry, the face appeared old. She improved considerably but had a relapse. The elbow was operated upon and a large splinter of wood removed with good result. Thyroid extract was administered with remarkable effects. The spasmodic condition of the muscles ceased, the skin and hair became normal and recovery was apparently complete. The possibility of tetany was ruled out by the absence of the usual reflex characteristics of that

disease. Tetanus was excluded by the fact that an animal inoculation from the wound produced no symptoms. The existence of infantile myxedema seemed certain. The usual symptoms were present and the thyroid glands were very small and indurated. There seems to be some reason in concluding that pseudo-tetanus is associated with disorders of the ductless glands.

4. *Remissions in Paresis.*—The clinical histories of fourteen cases are given. The remissions all followed acute exacerbations. In 8 of the cases (with a total of 11 remissions) the patients had received no treatment; in 6 (with 10 remissions) mercury, salvarsan or sodium nucleate had been administered. Five of these remissions followed the treatment, the other 5 were spontaneous. We are not justified in saying that the occurrence of remissions is a step toward the ultimate possibility of recovery. In striving for a favorable treatment a preliminary exacerbation should not be regarded as an essential for subsequent improvement or remission. The physical symptoms are often a reliable guide to the extent of the permanent psychic defect. The tabetic symptoms are much less important than cerebral symptoms (speech defect, etc.) and lateral cord symptoms.

(Vol. 32, No. 6. December, 1912)

1. The Psychology of Alexia. K. Heilbronner.
2. The Electrical Excitability of the Central Convolutions. M. Rothmann.
3. The Differential Diagnosis of Tabes and Lues Spinalis. W. Weddy-Poenicke.
4. Contribution to the Behavior of the Cremasteric Reflex in Functional and Organic Nervous Diseases, including Psychoses. E. Loewy.
5. Reply to Dr. Stier's Article, "The Etiology of Perverted Sexuality." M. Hirschfeld and E. Burchard.

1. *Alexia.*—A case of alexia is analyzed in order to throw some light on the mechanism of the disorder and especially to establish whether or not the disturbance of reading is necessarily an optical symptom. For this purpose the fact that the case was observed only clinically does not detract greatly from its value. A baker of 34 years with a luetic history had had apoplectic attacks for six years previously. One of these left him with a right hemiplegia and aphasia. When he came under observation the right limbs were almost useless, there was a right quadrant (upper) hemianopsia. All writing had to be done by the left hand; examination showed the following: Spontaneous speech good but occasionally he could not find correct words. There was little difficulty in naming objects seen and felt. Repetition of words was correct except for long polysyllables. There was no difficulty in giving the alphabet, days of the week and other successions, either forward or backward. When the uses of various articles were described to him orally he readily named the articles. He picked out objects named; succeeded with Marie's test with papers. Subjectively he complained of no difficulty in these spheres. In reading, however, he was quite conscious of his disability. He failed almost entirely to read letters and to show letters named to him. It was no help to trace them by leading his hand. He was able to "learn again" a few letters. He could not read aloud the names of objects nor pick out objects whose names were shown him. On the other hand he could always indicate the slip on which was written the name of the object when that

name was spoken. He could read a few words with which he was very familiar, as his own name and that of his village. He could read numbers up to three figures and could do simple sums. Figures could be differentiated from letters without hesitation, and meaningless characters interspersed with letters were usually detected although he accepted some Greek letters and some which were reversed. Capitals were distinguished from small letters but there was much difficulty in matching small letters to their respective capitals. He recognized letters that occurred in his name but could not call them. In writing test he was handicapped by the awkwardness of his left hand but this hand showed no apraxia. He could write only a few letters and his name was the only word he could write. He copied without difficulty but copied errors which were purposely introduced. He also copied simple geometric figures. There was no mirror-writing. He wrote several numbers to dictation. He could not spell the simplest word nor tell how many letters in it; neither could he recognize a word when spelt to him. He was shown several pictures with the name of each and soon came to know the first letter in each name. After that he could say which picture belonged to each initial letter. He could not find a letter " M " among several letters but readily found the letter which began the name of the " mouse " picture. In tests of optic recognition he identified geometric figures, crosses, banknotes, stamps (without seeing the numbers), etc. There was some difficulty in naming the individual playing cards but he could play games with them. He sorted colors correctly but there was much paraphasia in naming them. He could not give the colors of objects named to him but could point to the right color in a table. When given a color he could name several objects of that color and always recognized the error when animals, etc., were wrongly colored in a picture.

From the neurological symptoms it was probable that the lesion was in the usual position for producing alexia, namely the left parieto-occipital region. The case was not one of pure alexia, at least it must be called "alexia with agraphia," although much of the latter symptom was due to the awkwardness of the left hand. The alexia was " literal." What did letters look like and what did they mean to him? He must have seen them as letters for he readily differentiated them from figures. That the difficulty was not an optic defect was shown by many tests. A very important point was that the few letters which he did recognize were identified not by their sound but by their optic association, as the first letter in a word, letters in his name, etc. The disorder was doubtless one of comprehension and a very limited one, namely of the relation between an optic impression and a very special concept, that of the names of letters. In the reading of words the findings were peculiar. There was very pronounced disturbance in this function which may be divided into two categories. In the first are included the reading of words which he read aloud or grasped the meaning of. These included his name and very familiar words. These probably were not really read but their general form was associated in his mind with the corresponding object. The second category was not so easily explained. It concerned the ability, in some cases to find among a number of slips of paper bearing the names of objects, the one desired. He could, however, never read the name aloud nor, when the name was shown, could he find the article. In this task it did not appear that the patient identified the words by their general form and even if we accept the unlikely supposition that some men habitually read words as optical pictures and that the patient was one of these, why could he not read these words aloud, or, if his amnestic aphasia made this impossible, why could he not by pointing out the object indicate that he read the words? The question seems unanswerable as does the literal alexia. The author, however, offers an interesting discussion of the theoretic possibilities of the production of such a condition, *e. g.*, a lesion in the marrow of the parietal lobe interrupting communication between the visual apparatus and the sound-picture for letters—a lesion which need not produce optic defect, other than hemianopsia. The whole article is an enlightening dissertation on alexia from the psychological side and perhaps gains something in that direction by the absence of diversion to anatomical points.

2. *Excitability of the Central Gyri.*—A contribution to the much discussed subject of the motor and sensory functions of the central gyri. The experimental evidence is reviewed and some further research by the author is described. The arm area in the brain of a monkey was removed from the anterior central and the arm given care as to exercise. Three months later the posterior central gyrus was exposed and when stimulated by a relatively weak electric current produced contraction of the arm. It is necessary for the function of the paralyzed arm to be at least partially restored, before the posterior central gyrus becomes reactive. This is one reason for the different results of other experimenters. Regarding the path of the fibers from the post-central gyrus through the cord, a previous experiment showed that in apes they probably lie in the anterior columns. The conclusion is that no doubt remains as to the sensori-motor character of both central convolutions, at least in apes. In the anterior, however, the motor constituent is predominant, in the posterior, the sensory. After complete extirpation of the anterior central gyrus, the posterior gradually takes up the motor functions of the former to a large extent. The author does not make reference to the arguments of Bastian (*Brain,* Vol. XXXII, 1910) that neither of the central gyri should be regarded as motor centers but as sensory stations for the transference of elaborated volitions to the actual motor centers in the cord.

3. *Tabes and Lues Spinalis.*—Five cases with autopsy are described. In all there was definite lues spinalis anatomically but in only one had it been diagnosed clinically. In reviewing the histories of the cases no criteria are discovered by which the condition might have been suspected except that in several there were anomalous features in the course or symptomatology of the tabes. As a result of the observations it seems advisable to advocate energetic specific treatment in all cases presenting the symptoms of tabes. The cases are excellent anatomical studies of the lesions in question and are illustrated with photo-micrographs.

4. *Cremasteric Reflex.*—The center for this reflex lies in the third lumbar segment. Its absence on both sides is significant and means very probably an organic nervous disorder in those cases in which testicular disease, excessive masturbation, etc., can be excluded. Absence on one side is of less importance but has the same meaning. The reflex has about the same significance as the umbilical. The reflexogenous zone is frequently very extensive; in about 30 per cent. of the cases the reflex was elicited upon plantar stimulation.

5. *Perverse Sexuality.*—A rather severe criticism of an article by Stier in the September, 1912, number of the *Monatsschrift,* q. v. His views

on the biological origin of homosexuality are contested and incredulity is expressed at Stier's failure to find a single case of homosexuality among 3,000 defective children. This seems especially remarkable since study has shown the very frequent variations in infantile sexuality not only in those children who later become inverts but in normal children. Stier's experience is at variance with that of others observing a similar material. His opinion that masturbation is a factor in the production of homosexuality is difficult to understand. In its wide prevalence it would have to be made responsible also for every form of sexual development.

J. W. Moore (Central Islip, N. Y.)

Review of Neurology and Psychiatry

(Vol. X, No. 4)

1. Acute Myelitis and Thrombotic Softening of the Spinal Cord. Joseph Collins.
2. Myxedema Following Exophthalmic Goiter: Mental Symptoms; Death from Cardiac Syncope; Hemorrhage into the Nuclei of Both Vagi. A. Ninian Bruce.

1. *Acute Myelitis.*—Three cases of acute transverse myelitis are reported clinically, two of these with autopsy of the cervical cord only. One case was preceded by five months by retrobulbar neuritis, and one was accompanied by optic neuritis. The autopsy findings in these cases are quoted from reports by Holden in the *Archives of Ophthalmology,* August, 1911. The three cases reported were thought to be due to infection. No information as to the source of the infection in any instance was obtained. The retrobulbar neuritis preceding the myelitis, in one case, was thought by the writer to be due to the same infective process which caused the myelitis.

2. *Myxedema.*—Dr. Bruce reports a case with interesting autopsy findings. The patient, an unmarried woman, died at 46, after an illness of six years. She had always worked hard, as a domestic servant, and had never had a severe fright. Nervousness and palpitation were followed in two years by exophthalmos, and in four years by tightness and pain in the throat. The right lobe and isthmus of the thyroid were enlarged. Rest and good feeding at the Royal Infirmary diminished the thyroid swelling and caused enough general improvement to permit discharge from the hospital and return to work. After six months attacks of palpitation became more severe, accompanied by great weakness, breathlessness and pain, and great pain in the head, mostly frontal but sometimes diffuse. After a short time she lost memory, and became suspicious, and her attacks were accompanied by unconsciousness. On readmission to the Infirmary her heart was found dilated and there was a mitral systolic murmur. The thyroid had shrunk considerably. The eyes had shrunken. The arms and legs were swollen, but not the face. The scalp hair was scanty; the skin dry and thickened; hands tremulous; there was emaciation and inability to give any information about herself; she thought she was followed by persons who wished to kill her, and refused food from delusions of poisoning. A fortnight later her temperature rose to 105° and she died in thirty-six hours.

The autopsy showed numerous small hemorrhages in the brain and cord. Microscopically a degeneration of the cells of the intermedio-lateral tract was found, with similar changes in the large motor cells in the anterior horns, and marked vascular changes along the floor of the fourth ventricle. The vessels here were dilated, thickened and showed hyaline degeneration. Extensive and numerous hemorrhages, of old and recent date, had taken place. One of these had destroyed the left vagus nucleus; and four others were found in the right vagus nucleus. The interest lies in the fact that the tenth nucleus undoubtedly belongs to the same system of nerve cells as the intermedio-lateral tract, which is the spinal localization of the sympathetic system.

(Vol. X, No. 5)

1. Significance of the Babinski Reflex. George E. Rennie.
2. On the Frequency of Blindness as a Sequel to Organic Brain Disease. L. J. J. Muskens and W. Snellen.

1. *Babinski Reflex.*—Investigation of those conditions under which the extensor response occurs shows that the existence of permanent organic disease of the pyramidal tract is not a *sine qua non* for its occurrence. A mere temporary interference with the conduction of impulses along this tract, or with their origin in the brain, may determine it. Pressure on the motor tracts, such as causes also exaggeration of the deep reflexes, even if only temporary, may change the flexor to the extensor response. Two cases are cited. In one of hydatid cyst, a double extensor response became flexor again after operation. In the other, relief of pressure on the spinal cord, by lumbar puncture, resulted in a change of type of the plantar reflex from the extensor to the flexor, in a case of paraplegia. A third case, of temporary hemiplegia and migraine, showed a temporary Babinski sign which disappeared on recovery from the paralysis. Whether, in an individual case, this sign points to temporary or permanent organic disease must be determined by the other features of the case and its progress.

2. *On the Frequency of Blindness.*—Brief reports of 22 cases are given.

1. An unexpectedly large percentage of the pupils in a school for blind boys and girls were found to have never suffered from any ocular trouble, but to have been afflicted in early youth or about the time of puberty with some brain disease, accompanied by increased intracranial tension, choked disk and, as a sequel, optic atrophy.

2. This high percentage (20 out of 98 pupils) is probably lower than the truth, because all blind children who had given signs of defective mental qualities, fits, or paralysis had been refused admission.

3. In these patients arrested cases of tuberculous, syphilitic and various other new growths may be frequent; the result, however, of the inquiries from the medical attendants of the children (from the general practitioner on the one hand, and the oculists on the other) gives rise to a strong suspicion that more frequently encephalo-meningitis serosa (under which so-called pseudo-tumor and Aztek-skull (Turm-schädel) are to be included), and meningitis serosa migrans are at the bottom of the condition.

4. The question, whether this form of blindness can be prevented, has been affirmed in the present state of diagnosis and technique by all recent observers for the last twenty years, therein supporting the statements of Sir Victor Horsley. If a prophylactic proceeding be stated in the same way as with ophthalmia neonatorum, a similar lowering of the number of the blind may be expected.

5. The palliative operation, wherever there is increased intracranial tension, can be compared with iridectomy in glaucoma and with paracentesis in otitis media. They all aim at saving the function of an important organ, and are harmless operations performed at a period in which most effect may be expected. The best period for palliative trephining is as soon as a choked disk of more than two dioptres swelling does not subside spontaneously in a few weeks. Waiting till vision has suffered must be condemned.

6. Pediatrists and ophthalmologists are most concerned in these rules, since after an inquiry it has been found that children are most prone to suffer.

7. It seems advisable that in the forms for admission to institutions for the blind, some questions should be inserted, in view of this cerebral origin of the affliction.

8. Also in the decennial counting of the population, special questions could be inserted regarding the blind citizens, as such an inquiry might elucidate the frequency of this cause of blindness.

(Vol. X, No. 6)

Review of Bleuler's Schizophrenia. AUGUST HOCH.

This is more of a critique than a review, and an attempt to "abstract" it would be fruitless. We therefore reproduce a few quotations, recommending a full reading for a clear conception of both authors' views.

"The work of Bleuler on dementia præcox is undoubtedly one of the most important contributions which have been made to psychiatry for a long time. The most admirable part is the symptom-analysis which contains much that is of great value to every psychiatrist.

"In discussing the book it is of course necessary, first, to be clear as to what Bleuler means by schizophrenia, and what he includes in this group, because it comprises a great deal more than the group of dementia præcox, such as others conceive it. It contains all paranoic states, which are not the typical Kraepelinian paranoia; most psychoses which arise on the basis of psychopathic inferiority; probably many cases which, in order to emphasize certain impurities in the clinical picture, we here call 'allied to manic-depressive insanity,' and, indeed, not a few cases which we would not hesitate to group as typical manic states; furthermore, the transitory hallucinatory and paranoic states, and Bleuler even suggests that the acute alcoholic hallucinoses may belong here entirely; again, all the chronic alcoholic paranoic or hallucinatory states; the prison psychoses and, as we shall see, many states which we prefer to call abnormalities of make-up. It is not surprising that Bleuler finds very little that remains to be classified in psychiatry, so far as the functional psychoses are concerned; and he practically mentions only the somewhat uncertain group of the fever psychoses. Therefore, with the exception of manic-depressive insanity, which to him is small, the few cases of Kraepelinian paranoia and hysteria, everything within the functional group of psychoses is dementia præcox."

"In studying the symptomatology Bleuler speaks of fundamental symptoms and of accessory symptoms, but he speaks also of primary symptoms and secondary symptoms, and these two sets of groups are not coextensive. . . . Among the *fundamental* symptoms, by which he means symptoms which are always present to a certain extent in active as well as latent schizophrenia, he mentions, above all, a disorder of the association process, that is, a primary loosening of the connection. He also mentions abnormalities of the affective life, particularly a more or less extensive loss of interest, and that which he calls by a very good term 'autism,' that is, the tendency to turn away from the outside world, or that which we have called shut-in tendencies. . . .

"Among the *accessory* symptoms are the acute symptoms of the psychoses: delusions, hallucinations, katatonic states, etc.

"Now the *primary* symptoms: By that he means the symptoms which are in his opinion directly due to the disease process which he postulates, admitting, however, that we do not know this process, and he also concedes that the possibility of a purely psychogenic origin of dementia præcox cannot be denied absolutely. This supposed disease process he is inclined to regard as associated with some poison, and he takes the analogy of rheumatism which may be either chronic or acute, which may last a lifetime or stop. These primary symptoms, which he attributes directly to this underlying disease process, he also admits are not definitely known, and it should here be stated that Bleuler is very open in his theorizing and speaks of it as tentative. However, he is inclined to think that the association disorder, that is, as I said, a loosening of the associations which gives rise to elisions, to marked defects in logical thinking, even to imperfect concepts, etc., is a primary defect. As we shall see, Bleuler explains a great deal in the clinical picture of schizophrenia psychologically on Freudian mechanisms; the blocking and other disorders in thinking, acting, and feeling, are referred to a great extent to this.

"As to the *secondary* symptoms, they are caused, as we have already said, by a combination of the action of the primary ones and the action of psychogenetic factors. However, he admits that his assumed disease process and the clinical pictures are often remarkably independent of each other, and that most syndromes do not depend upon the disease process. In spite of his conviction of the importance, therefore, of psychogenesis for the production of symptoms, and even acute syndromes, he lays very little stress, in his chapter on etiology, upon the mental causes. The reason for this is quite clear; it is because the mental causes do not produce the disease, but merely some symptoms, and as a matter of fact he has very little to offer in the way of etiology. According to Bleuler, mental causes produce attacks, but the disease has existed before."

What is said on the question of *demarcation* and *combination* with other disorders will have to be omitted. Also the description of symptoms in detail.

"It would seem to us rather unfortunate if this book of Bleuler, although one cannot say enough of its value as a help in symptom-analyses, would lead us to widen the group of dementia præcox still further. Before we allow ourselves to be influenced in this way, we should make it clear to ourselves what our standpoint is. We cannot entertain our own point of view and diagnosticate dementia præcox as Bleuler does. On the other hand, we cannot have Bleuler's standpoint and diagnosticate, for example, an impure manic state as allied to manic-depressive insanity, because that presupposes a totally different psychiatric standpoint. Whether we are right or whether those who speak of circumscribed diseases or disease process are right, or how much of a compromise is possible, is perhaps as yet an open question, but as a working hypothesis, at any rate, it would seem that our present way is the more open one."

(Vol. X, No. 7)

1. Multiple Heterologous Cerebrospinal Tumors; Endotheliomata of Cord, Gliomata of Pons and Corpus Callosum. MORRIS J. KARPAS AND CHAS. I. LAMBERT.
2. A Case of Cerebral and Crossed Cerebellar Hemiatrophy. WILLIAM BOYD.

1. *Cerebrospinal Tumors.*—The case reported was one with multiple new growths of different structure and position, one an endothelioma involving the thoracic cord, the others gliomata involving the pons and corpus callosum. Mental symptoms, paraplegia and cerebral tumor symptoms existed. In diagnosing the case, cerebral syphilis was considered on account of the multiplicity of symptoms, which were difficult to explain by one lesion, but the laboratory findings did not support this assumption; cerebral tumor seemed the most probable condition. The localizing symptoms were rather vague, but on account of a preponderance of right-sided symptoms, the tumor was thought to be in the left frontal region; the possibility of a corpus callosum tumor was suggested, but the greater probability of the tumor being in the left frontal region was accepted. The left frontal and anterior parietal regions were selected as the seat of operation, but no tumor was found. The autopsy findings were as above stated. The article is accompanied by plates.

2. *Hemiatrophy.*—The patient was an epileptic woman of 26, diagnosticated mentally variously, as an imbecile of low grade, an idiot, and as a case of amentia. There was right hemiplegia with the usual sequelæ. She had numerous fits without localizing value, and died in status.

The macroscopic appearance of the brain when removed was very striking. The left cerebral hemisphere was extremely shrunken, and appeared to be converted into a thin-walled cyst filled with fluid, whilst the right side of the cerebellum was considerably smaller than the left. The ratio between the two halves of the cerebrum was as 4.1 is to 1, and between those of the cerebellum as 1.7 is to 1. A description of the microscopic appearances will have to be omitted.

The case is of interest in view of the discussion which is at present taking place regarding the relationship of idiocy to imbecility. The old and classical doctrine that these two conditions are merely different degrees of the same process has been called in question, and it is now maintained by certain Continental authorities that they are totally different, both anatomically and etiologically, imbecility being a hereditary degeneration, whilst idiocy is a cerebropathy acquired in intra-uterine or early extra-uterine life. Gross or microscopic lesions can be demonstrated in the idiot, but are absent in the case of the imbecile. Perhaps the most important factor in these infantile cerebropathies is the neuroglia, which is an active growing tissue responding readily to any form of irritation, and not merely subserving a passive function as in the adult. A small focal lesion which may have involved only a limited portion of nervous tissue may stimulate the active neuroglia to such an extent that a wide area becomes sclerosed and strangled. The appearances found lead one to conjecture that some such process must have taken place to a large extent in the present case, especially in the basal ganglia and cerebrum. In the cerebellum the condition is more one of aplasia.

In addition to pathological differences there are certain fundamental psychical differences between the two conditions, and the mental state of the patient corresponded closely to that which is described as being characteristic of the idiot. She was dull, apathetic, and unimpressionable, and totally lacked the mental mobility and loquacity of the true imbecile. Instead of calling the case one of imbecility it would, therefore, be more correct to class it as one of infantile cerebropathy.

The article is accompanied by plates.

C. E. ATWOOD (New York).

New York State Hospital Bulletin

(Vol. V, Aug. 15, 1912, No. 2)

1. Focal Symptoms in General Paralysis. C. MACFIE CAMPBELL.
2. A Summary of the Syphilitic and Metasyphilitic Cases in 152 Consecutive Autopsies. CHARLES I. LAMBERT.
3. The Clinical Interpretations of the Serological Content of the Blood and Cerebrospinal Fluid with some References to Cytology and Chemistry of the Latter, in Mental Diseases. MORRIS J. KARPAS.
4. Review of Bleuler's Schizophrenia. AUGUST HOCH.
5. The Relation of Manic-Depressive Insanity to Psychoses. F. R. HAVILAND.
6. Minutes of Quarterly Conference, February, 1912.
    (a) On the Inheritance of the Neuropathic Constitution. A. J. ROSANOFF.
    (b) Report of the Committee on Mental Hygiene to the Annual Meeting of the State Charities Aid Association.
    (c) Report of the Committee on Legislation.
7. Minutes of Quarterly Conference, April, 1912.

1. *Focal Symptoms in General Paralysis.*—The author directs his theme towards those cases of general paralysis whose focal symptoms are more or less intimately connected with the paretic process and merely mentions a few instances where focal symptoms were due to other disturbances, such as trauma. He states that the evolution of a case, which at an early stage presents evidence of syphilitic vascular disorder in a case of general paralysis, may be more or less rapid and the clinical picture may present a combination of more than one process. The exact stage at which the onset of the paretic process has begun is extremely difficult to determine even with the aid of modern serological methods. The clinical picture of the case is sometimes insufficient to enable a positive diagnosis, an autopsy may not yield the decision, microscopical examination of the cortex is necessary. The value of histopathological changes is obvious, but the relation of these changes to disease processes is quite obscure and a focal symptom may be the result of a localized severity of paretic process. Then again there are cases where the brain reveals nothing as an adequate cause for the clinically focal symptoms.

2. *A Summary Review of the Syphilitic and Metasyphilitic Cases in 152 Consecutive Autopsies.*—The writer has given a very interesting series of cases both clinical and pathological, dividing the syphilitic processes according to their pathological findings. He refers to the chronic endarteritic-meningitic forms which are so closely related to cerebral syphilis on one hand and general paralysis on the other. The cytoserological findings were carried out on but a limited number of these cases. Consecutive serological examinations and critical pathological study, controlled by careful clinical observation, might shed some light upon the evolution of these metasyphilitic processes.

3. *The Clinical Interpretation of the Serological Content of the Blood.*—The author bases his results upon 222 cases selected from 300 available cases and divides his material into two groups, the first group including para- and metasyphilis, and the second group organic psychosis of non-luetic origin, toxic, epileptic and functional psychosis. In group one, there were 100 cases of general paresis; seventy-two were fully developed, out of which forty-nine showed a positive Wassermann in the blood and fluid; seven gave positive reaction in blood and negative in the fluid; four positive in fluid and blood not examined; nine a negative reaction in the blood and a positive reaction in the fluid and three negative in both. The globulin content was present in sixty-six out of the seventy-two. A lymphocytosis was present in all but one of the series. Twenty-two cases of late general paresis evinced positive Wassermann in blood and fluid of fourteen, seven negative in fluid and positive in blood and one negative in both. There were seven cases of clinical general paresis but serologically negative. Three cases of cerebral syphilis, gummatous type, gave all positive Wassermann in blood, negative in fluid; cells increased in two and globulin in one. The meningitic type one case, positive blood, negative fluid, high cell count and increased globulin. Endarteritic type six cases, five positive in blood, one negative. All negative in fluid. Globulin positive in five. Cells increased in five cases. In the second group of alcoholic psychosis presented nothing pathological in the fluid but an occasional positive Wassermann in blood serum. In the epileptic psychoses neither blood nor fluid revealed anything striking.

4. *Review of Bleuler's Schizophrenia.*—Professor Hoch has given an excellent review of Bleuler's schizophrenia, comparing it here and there with the trends of thought of others, such as Meyer and Freud, completing his review with the statement that whether we are right or whether those who speak of circumscribed diseases or disease processes are right, or how much of a compromise is possible, is perhaps as yet an open question, but as a working hypothesis at any rate, it would seem that our present way is the more open one.

5. *Manic-Depressive Insanity and Infective Exhaustive Psychosis.*—Haviland describes ten cases in which there was a definite etiology of an infective state and ascribes the hallucinatory trends, clouding and delirious states to the infective process. The onset is more abrupt without the prodromal signs, the duration being somewhat shorter than the manic-depressive insanity, with unknown etiology. The manic makeup is less evident, previous attacks rare, prognosis for future attcks perhaps better and in his series after three years none had had recurrence.

6. *Inheritance of the Neuropathic Constitution.*—The author explains very accurately and concisely the meaning of the Mendelian theory and compares actual findings with the theoretical expectation of the theory. He refers to having data which indicate that there are conditions of different degrees of recessiveness and of neuropathic equivalents. He then refers to its influence in psychiatry and its relation to practical eugenics.

Farnell (Butler Hospital).

Brain

(Vol. 35, Part 2)

1. Some Observations on the Growth and Survival Period of Intracranial Tumors, Based on the Records of 500 Cases, With Special Reference to the Pathology of the Gliomata. Howard H. Tooth.

2. The Path of Encephalic Infection in Otitis. C. Tylor.
3. Some Rarer Manifestations of Para-syphilis of the Nervous System. A. Read Wilson.

1. *Intracranial Tumors.*—Tooth here studies 500 intracranial tumors which came under observation at the National Hospital during the period of ten years—1902 to 1911 inclusive. The regional classifaction was as follows, whether verified or not:

The author considers the localizability of these tumors, and then takes up the study of the survival-period of tumors from the appearance of the first symptom to death, which contains too many details to be analyzed. Inasmuch as glioma occupies the first rank in growths that affect the brain, a special section is devoted to their life history. 49 per cent. of the cases were gliomata. Tooth says that the glioma when it enters upon an active stage by the very exuberance of its activity carries on within itself a process of self-immolation. Also that this aspect of the question centers round the blood-vessels, which may increase vastly in numbers—an angiomatous stage; become blocked—an intimal proliferative stage; thrombosis spreads backward into larger vessels—a thrombotic stage; and lastly there results necrosis of the area concerned. If this is the true sequence and proper interpretation there may be some hope of treatment in the future by some application of ultra rays after removal of the bone, such as has given results in some other vascular growths.

Region.	Sex.		Total.	Per Cent.	
	M.	F.			
1. Frontal	60	40	100	21.7	Fore-brain : 239. 52 per cent.
2. Central pre- and post-parietal	43	20	63	13.7	
3. Temporosphenoidal	24	25	49	10.6	
4. Occipital	8	6	14	3.0	
5. Corona radiata; corpus callosum, etc.	4	6	10	2.1	
6. Lateral ventricle	2	1	3	0.6	
7. Pituitary	10	4	14	3	
8. Optic thalamus	4	2	6	1.3	
9. Mesencephalon	18	8	26	5.2	Mid-brain : 30. 6.5 per cent.
10. Pineal	4	—	4	0.8	
11. Choroid plexus; III and IV ventricles	4	1	5	1.0	
12. Cerebellum	44	33	77	16.7	Cerebellum and pons : 160. 34.2 per cent.
13. Extra-cerebellar	19	21	40	8.7	
14. Pons	19	24	43	9.3	
15. Medulla	—	1	1	0.2	
16. Base	1	3	4	0.8	
Total	264	195	459		
17. Not localized	24	17	41		
Grand total	288	212	500		

But this is only one side of the matter. The larger question still remains, how to meet the forces that are seething within the rapidly growing tumor. Complete recovery of the diffuse forms is practically impossible. One may almost assume that the earliest possible stage of growth, when the tumor might conceivably be removed completely, is undiagnosable in most parts of the brain. A removal as complete as possible seems to be followed by increased activity, and recurrence, or, worse still, a relatively latent growth, may be awakened into malignity. It seems that in the present state of our knowledge we must be content with relieving pressure by decompression in all gliomata, lest worse befall.

2. *Otitic Infection.*—In a short introduction, the author of this paper states that its object is the investigation of the various pathways by which infective processes, originating in the ear of the human subject, may reach the interior of the cranium.

The enquiry has been approached from the standpoint of the human morbid anatomist by a study of the post-mortem records of 644 cases of intracephalic infection, including 267 cases of infective diseases of the ear. Particular attention has been directed to those cases in which actual post mortem has demonstrated the origin and spread of infection, or in which the infective processes had been observed during life in the course of operative procedures.

The chief forms of intracranial infections met with are: (1) Lateral sinus thrombosis. (2) Brain abscess, including both cerebral and cerebellar abscess. (3) The various forms of meningeal infection. Of this latter he considers (*a*) Pachymeningitis, in which the dura mater and, more especially, its external surface (pachymeningitis externa) is alone affected. (*b*) Extradural abscess, in which a collection of pus forms between the dura mater and the bone. (*c*) Intradural abscess, in which the pus is formed between the dura mater and the arachnoid, and is limited to one particular spot by adhesions between the membranes. (*d*) Purulent leptomeningitis, in which pia and arachnoid membranes are chiefly involved—the purulent form generally affecting a large area of the brain—which is usually in a condition of encephalitis. (*e*) Serous meningitis and internal hydrocephalus. (*f*) Tuberculous meningitis concomitant with infective disease of the middle ear.

The writer says that his object in conducting the investigation was that of ascertaining, first, the most common situations of the different intracranial lesions, and, secondly, the paths whereby the infective microorganisms have been enabled to gain access to intracranial structures.

The general conclusions arrived at in this very significant and important paper are that infection through vascular channels appears to be responsible for most cases of lateral sinus thrombosis, while vascular infection is a cause of extradural and brain abscesses in a large number of cases.

Many cases of extradural abscess are due to disease of the petrous bone, especially its posterior surface and tegmen; in those cases where the bone is unaffected, the dura mater becomes infected through a septic endophlebitis of a vein of the tympanic mucosa extending to a vein of the dura. Cerebral and cerebellar abscesses may be due to direct contact of the brain with diseased dura mater; if perforation of the latter takes place, direct extension to the cerebral substance may occur; if no perforation occurs, the disease may spread to the brain by infection of the veins in the dura, with extension from them to the vessels of the pia-arachnoid, and from the latter to the interior of the brain.

Cerebellar disease is also often secondary to infective labyrinthitis, extension of the disease taking place along the nerve-sheaths, or directly in the region of the posterior semi-circular canal.

Leptomeningitis is either (*a*) secondary to a gross intracranial lesion or bone disease, in which case it is due to the rupture of an abscess into the intradural space or to vascular infection from the lateral sinus, abscess or bone, as the case may be; or (*b*) to labyrinthitis, with infection spreading along the nerve sheaths, or vascular infection from the middle ear direct.

The results of this investigation show that infection of the labyrinth is responsible for many cases of cerebellar abscess and meningitis of otitic origin. Formerly, disease of the labyrinth owing to lack of knowledge as to its pathology, did not receive sufficient attention as a cause of intracranial infection. Of recent years, however, our knowledge of the diseases affecting it and their bearing on the subject of encephalic infection, has increased rapidly.

At the present time, surgeons when operating for disease of the middle ear pay more attention to fistulæ or necrosis of its inner wall as evidence of possible labyrinthine involvement. Moreover, various clinical tests which have been introduced lately such as the rotation tests and the caloric and galvanic reactions, when taken together, appear to afford a fairly sure means of diagnosing this condition In this way many cases of labyrinthine infection are discovered which in earlier years would almost certainly have been overlooked.

A considerable number of cases of tuberculous and cerebrospinal meningitis occur in patients with infective ear-disease in which the latter is not the obvious cause of the meningitis, and the question as to whether the ear can be regarded as being the channel of infection in such cases requires to be further investigated.

3. *Parasyphilis.*—The author confines himself to a consideration of primary optic atrophy, primary lateral sclerosis, and progressive muscular atrophy. All of these diseases, he says are of the same primary character —a degeneration of neuronic groups. Tabes dorsalis is the manifestation of a degeneration of the spinal sensory protoneurons; general paresis, of the cortical association neurons; primary optic atrophy, of the visual neurons; primary lateral sclerosis, of the upper motor neurons; progressive muscular atrophy, of the lower motor neurons.

In the cases of tabes and general paresis the essential etiological factor is the same, syphilis; the oft-quoted alternative factors, "alcohol, hard work, exposure," are the same; the average interval between infection with syphilis and the declaration of symptoms is the same; the average age-incidence in the same; the symptoms and termination are analogous; signs of gross syphilitic lesions are infrequent, since both usually follow mild attacks of syphilis; and the two diseases are frequently combined in one individual. Moreover, both may attack the subjects of either acquired or congenital syphilis.

Some cases of primary optic atrophy, primary lateral sclerosis, and progressive muscular atrophy show an extraordinary analogy to the above —extraordinary, that is, if they are to have a different etiology, but natural enough if considered as para-syphilitic manifestations. Many give histories of syphilis, others have signs of syphilis remaining on their bodies, or they give positive Wassermann reactions. Evidences of gross syphilitic lesions too are rare, since the primary stages have in most cases been mild. Alcohol, hard work and exposure are again amongst the most commonly accepted etiological factors. The average interval between syphilitic infection and the appearance of symptoms is about the same as in tabes and general paresis. The average incidence is the same, though in primary lateral sclerosis the onset is so gradual that the patients do not seek advice at the commencement. All three are generally found associated with tabes, less often with general paresis; cases occur where two of them are associated, or where multiple combinations are exhibited.

His conclusions are as follows: There is no doubt that in the vast majority of cases of tabes and general paresis of the insane syphilis is the essential cause. They are parasyphilitic nervous diseases.

There is evidence that at all events some cases of primary optic atrophy, primary lateral sclerosis and progressive muscular atrophy, are parasyphilitic too. A history of syphilis or a positive Wassermann reaction, and in some instances the post-mortem examination, point to this being so.

In tabes and general paresis there is degeneration of certain neuronic tracts or groups; and degeneration of precisely the same character in other neuronic groups produces primary optic atrophy, primary lateral sclerosis and progressive muscular atrophy.

Combinations of all three with tabes or general paresis, or with both, or amongst themselves, are so frequent that it is difficult to withstand the conclusion that their essential etiological factor is the same, more especially since it is conceded that syphilis has a great affinity for the nervous system.

If it be allowed that the neuronic degeneration of primary optic atrophy, primary lateral sclerosis, or progressive muscular atrophy when combined with that of tabes or general paresis is due to syphilis, it cannot be denied that such degeneration, occurring uncombined, may still be parasyphilitic.

The Argyll-Robertson pupil is recognized as a symptom of tabes and general paresis, in other words it is a parasyphilitic manifestation. It is found also with primary optic atrophy, primary lateral sclerosis and progressive muscular atrophy.

If the question of antecedent syphilis were carefully investigated in every case of primary optic atrophy, primary lateral sclerosis and progressive muscular atrophy, or better still if every case were subjected to Wassermann's test as well, he believes that an accumulation of evidence, entirely analogous to that obtained in determining the etiology of tabes and general paresis would soon be at hand, and that these three diseases, at present wandering in the Wilderness of Undiscovered Causes, would take their rightful place amongst the rarer manifestations of parasyphilis of the nervous system.

JELLIFFE.

Book Reviews

A TREATISE ON PELLAGRA. For the General Practitioner. By Edward Jenner Wood, S.B., M.D. D. Appleton & Co., New York and London.

The importance of pellagra has been too long overlooked in neurological medicine. Fortunately the last five years have seen abundant correction of this defect, towards which this monograph of Dr. Wood's will abundantly serve.

That such monographs as the present one can find a publisher is a hopeful sign of progress in American medicine. It seems to point to the fact that the rank and file are prepared to get away from "Quiz Compend" medicine, that particularly noxious brand of tabloid information so dear to the lazy student.

This particular work is well done and is particularly rich on the side of nervous and mental symptomatology.

LANG'S GERMAN-ENGLISH DICTIONARY OF TERMS USED IN MEDICINE AND THE ALLIED SCIENCES. Revised by Milton K. Meyers, M.D. P. Blakiston's Son and Co. $5.00.

The second edition of this very useful dictionary has just been received. It has been carefully revised and contains many additions in the fields where it was previously lacking, namely in neurology and psychiatry. To readers of this journal particularly it will be welcome as German literature contains so much of value and such a work is of distinct value.

UEBER DAS SINNESLEBEN DES NEUGEBORENEN. (Nach physiologischen Experimenten.) Von Dr. Silvio Canestrini, Assistent der Nervenklinik in Graz. Julius Springer, Berlin. 6 marks.

This is No. 5 of Alzheimer & Lewandowsky's series of monographs, notices of former numbers of which have appeared in these columns.

In his Vorwort the author emphasizes the need for a consideration of the recapitulation theory with reference to psychical development. He shows that we shall be able to understand human activities solely by a review of their origins. The present communication limits itself to the individual development, utilizing physiological modes of research which have heretofore not been employed.

The great mass of material which has accumulated relative to early development and infantile reactions has rarely made use of exact methods of observation. The early studies recorded only what could be seen objectively. The reactions to pleasure and to pain, to various forms of stimuli were recorded in some form of visible activity. Such are highly complicated motor acts and develop comparatively late. Hence the author decided to utilize the cardiovascular apparatus as an index of reactions, finding that such could be used whether the infant was asleep or awake. Whereas infants while asleep would show no reactions to pressure, pain, sound, light and other stimuli by means of movement or other sign recognizable by the unassisted senses of the observer, they nevertheless showed marked reactivities in their cardiovascular apparatus, showing much activity in the unconscious.

Canestrini therefore has forced the study of the infantile psyche into a hitherto unknown realm—*i. e.*, unknown from the physiological point of view—but hypothetically well studied through the labors of psychoanalysis. He thus attempts a partial analysis of impulses, instincts, utilizing the concept that "an instinct is an incomplete and not clearly defined type of will," which concept lags behind that of Bergson very materially for practical purposes.

The study takes up the reactions of the newborn to sensory stimuli of all known types and gives a fund of information and stimulates a host of ideas which will prove of great value to the student of mental problems.

We cannot summarize the results obtained. They are worth while reading in the original.

THE FIRST SIGNS OF INSANITY. Their Prevention and Treatment. By Bernard Hollander. Funk & Wagnalls Company, New York.

The author starts with the statement that "it is difficult to get rid of antiquated notions on the subject of lunatics." With this we heartily agree and recommend him to first clean house himself, as this book is filled with the most antiquated notions that we have seen for a long time in a book which offers such excellent advice. The author's impression that there is such a *thing* as insanity is the first archaic relic. This is pre-Hippocratic and survives in nonthinking minds under the impression that all mental diseases are one. The brain is the entire body. Mental disorders are various and many and any attempt to generalize as this author has done is nonsense.

The best we can say is that the work is of grab bag construction, containing an unassorted collection of statements, many of which are of value, many are rubbish. Inconsistencies of all kinds abound. This type of hodgepodge is responsible for the antiquated notions still extant among the people rather than a corrective for them.

At the same time there are many excellent features which, were the undesirable one's culled out, would make the book very valuable. If the author had really seen how legal attempts to treat sick people by police regulations, certification, foolish laws and inane medical jurisprudence fail he would have escaped many errors. Then again a little knowledge of psychiatry would have done him no harm.

JELLIFFE.

THE INFLUENCE OF MONARCHS. Steps in a New Science of History. By Frederick Adams Woods, M.D. Macmillan Company. 1913.

The author's "Hereditary in Royalty" was a valuable book and showed wherein certain biological facts concerning heredity might well be sought for. The author here continues his studies in this field, applying his methods to a larger measurement of historical data in order to apply them to social problems of national growth and decline.

In general the author's thesis is that monarchs themselves by their personality are responsible in large measure for the changing conditions. Heredity therefore becomes the master key to the study of history. These were the general tenets held in his first work.

This second volume attempts to measure not so much the full influence of monarchs as their lower limit of influence and by a series of comparative tables, an attempt is made to establish a new type of historical mensuration.

It seems to the reviewer to be a laudable attempt and very fascinating; a trifle simplistic, at times almost naïve—anecdotal features being utilized as dynamic factors—yet on the whole stimulating, entertaining and bold.

MALINGERING AND FEIGNED SICKNESS. Sir John Collie, assisted by Arthur H. Spicer, M.D. Longmans, Green and Co., New York. $3.00.

"To those who may think that being acute to detect fraud, and to prevent lapses into a species of fraud, are not within the province of a medical man, I would put the question: Are not the confining of sympathy and benefits to their proper channels, the prevention of improper claims against innocent persons, and the restoration of useful occupation of those who might otherwise become parasites of society, services which deserve well of the community?" This is an intimation of the general point of view which has animated the authors in the preparation of this very valuable short treatise.

Workmen's compensation acts have been the direct cause of the issuance of this work and as in the United States similar drifts in legislation are clearly to be perceived the work will prove valuable here as it undoubtedly will show itself to be in England.

The authors present a fairly comprehensive manual in which the examination of the nervous system and special senses looms large in the general perspective. The book is moderately modern. Thus in the section on hysteria it is clearly seen that the prevailing point of view of the average corporation defense lawyer, that hysteria equals malingering, is subjected to a careful analysis.

We cannot go into details in our review. While there is much left unsaid in the various sections which might well have been included, in view of the size and general purposes of the work it is most excellent.

THE TREATMENT OF INFANTILE PARALYSIS. By Oskar Vulpias, M.D., of Heidelberg. Translated by Drs. A. H. Todd and J. J. Clarke. Wm. Wood & Co., New York.

This work, while preëminently of surgical interest, is one that no neurologist who comes in contact with poliomyelitis can overlook. It is a volume which does not lend itself to review, as it is essentially a practical treatise dealing for the most part with the surgical correction of motor defects due to this disease. Various mere technical surgical treatises or volumes on orthopedics treat of the same subject matter, but this volume gives one the impression of great thoroughness and soundness by one who understands the neurological as well as the surgical aspects of the problems involved.

FOUNDERS OF MODERN PSYCHOLOGY. By G. Stanley Hall. D. Appleton & Co., New York and London.

The Introduction tells us that this book is an amplification of six lectures given early in 1912 at Columbia University to an audience composed of students and a wider public. They were not addresses to experts and were designed to give those who heard them some general idea of the personality, standpoint, and achievement of each of the men described.

Dr. Hall then goes on to give the life histories and summaries of the views of Drs. E. Zeller, R. H. Lotze, G. T. Fechner, E. van Hartmann, H. H. L. F. von Helmholtz, and W. Wundt.

The whole is a very charming medley of personal contacts, of well-digested and comprehensive abstracts, of various views of leaders in psychology, excellent bibliography, references and interesting portraits. It is a type of work that will appeal to all, not only for its attractiveness, but also for the evidence of its human interests, and scientific comprehension. We have read no work in recent years along these lines which has been so delightfully presented.

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UEBER HALLUZINOSEN DER SYPHILITIKER. Von Privatdozent Dr. Felix Plaut. Julius Springer. 5.60 marks.

Another worthy addition to the Alzheimer Lewandowsky monographs is this No. 6 of Plaut's. This author has contributed widely to the solution of the problems of nervous syphilis, his work with Wassermann (see Monograph Series of Journal of Nervous and Mental Disease) being the forerunner of the definite solution of the syphilis-paresis question, which finally came about through the findings of Moore and Noguchi.

Plaut had previously shown that many types of psychoses might occur in syphilis other than the syphilitic forms of feeblemindedness and paresis, and in 1909 he published an important study on syphilitic mental disturbances which was largely incorporated in Kraepelin's last edition of his text book.

The present volume is largely a detailed following out of the program sketched some years earlier.

It is a volume that no psychiatrist can overlook. He discusses psychoses with hallucinations of hearing, tabetic psychoses, and syphilitic hallucinosis in a narrow sense, *i. e.*, those acute and chronic forms of confusion with hallucinatory episodes which have made up a large number of psychoses of uncertain classification. These have largely been cleared up on the basis of the serological and biological techniques.

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Notes and News

Dr. Frank P. Norbury, alienist, Board of Administration of Illinois, has resigned, effective October 1, 1913. Dr. Norbury will enter upon consulting practice at Springfield, Ill.

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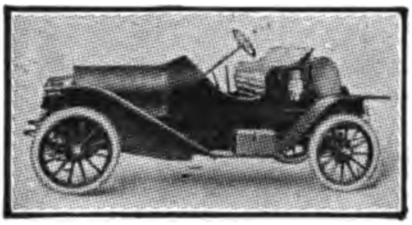

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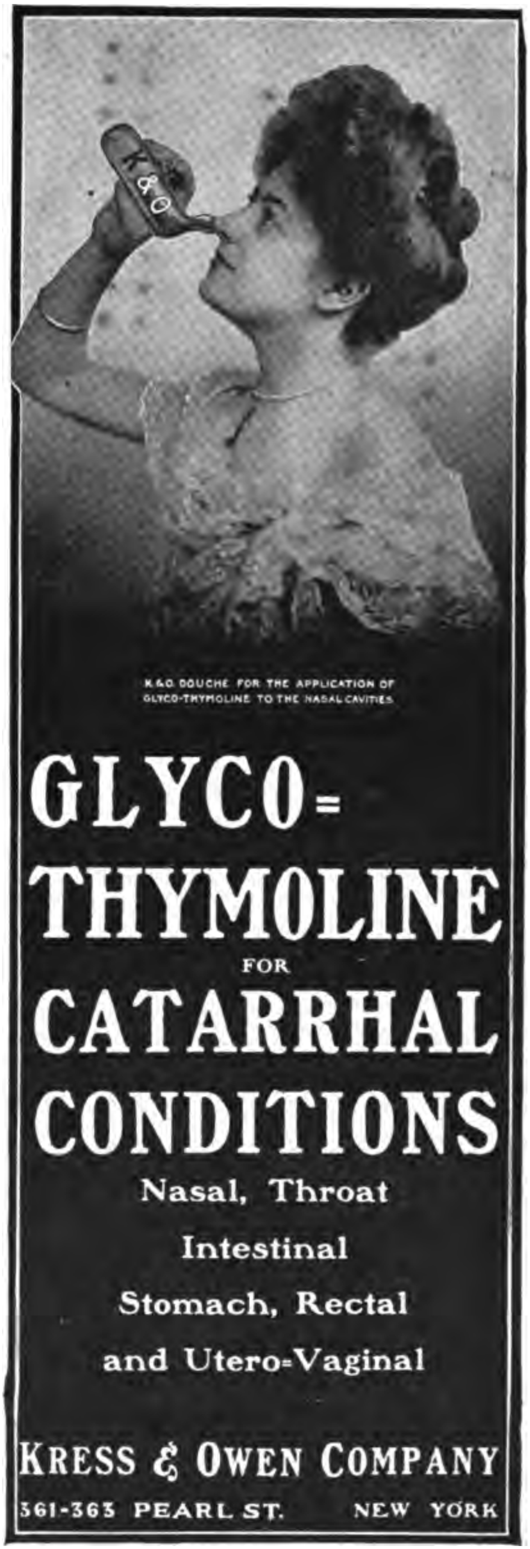

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OF
Nervous and Mental Disease

An American Monthly Journal of Neurology and Psychiatry, Founded in 1874

Original Articles

THE FUTURE OF NEUROLOGY[1]

By Charles L. Dana, M.D., LL.D.

It is proper, at times, to stop a moment and take count of the trend of activities in the department of science and branch of medical art which we are pursuing.

The field of neurology has undergone notable changes since the study of the nervous tissues began to emerge as a specialty. One hundred years ago, there were many books and articles published under the head of the term "Neurology" but they were practically all anatomical contributions and although there was a neurology there were no neurologists. During the next fifty years, various attempts were made to build up a medical neurology. There was good work done in England, Germany, and especially in France. Perhaps a dozen names remain to us out of those days. But the tools were lacking and the methods of approach were wrong. During this time we might say that there were some neurologists but no neurology.

Finally, however, came the microscope, the knowledge of the animal cell, the cellular pathology. The implements of investigation began to be applied in the positive and objective methods brilliantly organized in France and fruitfully applied there and by the Vienna School.

It was about fifty years ago that neurology, outgrowing the handicap of the past and supplied with sound working methods and rich opportunities, took its real start and became an enlightened and progressive science. It, at that time, was a science full of unsolved problems and important lines for research. The best minds of medicine entered it and reaped rich rewards in fame and the satisfaction of achievement. Students of internal medicine felt its importance and in every university center the greatest clinicians did their best work and most illuminated their career with its study. There was opportunity constantly at hand to explore new fields, to penetrate the mysteries of nervous symptoms and give to them anatomical basis and physiological explanation. The work has been steadily and brilliantly pushed on, and as a result we have to-day both a science of neurology and sound neurologists. The goal of their activities has been measurably reached. Neurology has much to learn, many fields to explore, many new phases of nervous disturbances to confront, new phenomena to interpret; but the great problems have been relatively solved so far as they can be by the present methods,—or we are on the way to solve them. We have many clinics, laboratories, teachers and workers, so progress will go surely and steadily on.

---

[1] Read by title at the thirty-ninth annual meeting of the American Neurological Association, May 5, 6 and 7, 1913.

Meanwhile, much of what has been systematized and explained by neurologists has been most naturally and properly appropriated by the general practitioner; so that we find he can and does deal with the commoner and even the serious neuroses.

Sometime ago, the trend seemed to be that the practicing neurologist might be driven to employ himself in a smaller field of work and one that is most difficult, that of the diagnosis of rare and incurable disorders, or those which are only to be combated by very special resources and equipment. The neurologist in practice was becoming more distinctly and acutely a specialist and a technician. In scientific investigation the progress of his discoveries was not ceasing but moving along narrower and less dramatic lines. This I say has been the tendency and was the situation up at least to a few years ago.

In these very much later years, however, he has been opening up new fields for himself in the study of psychoneuroses, in recognizing the importance due to subjective states, and the importance to all neuroses of environment, education and hereditary conditions. He has learned the art of investigating the character, temperament and social conditions of his patients; their habits of life, heredity, education and the fundamental traits of their natures. More than any other class of physicians he is overcoming the habit which gripped the profession when scientific and laboratory methods began to prevail fifty years ago, of looking at the man only as a case. We can appreciate a paraphrase: "O laboratories! how many crimes are committed in thy name!"

Seeing and working from this point of view the neurologist has aimed to add to his medical activity those in some degree, of an educator, preacher, sociologist. It is an important and responsible function which he aspires to assume, but he must do it or sink into the narrow niche of curator of the scleroses or an appraisor of teratological defects. On the other hand, the widening activity will bring rewards to himself as well as others. He will be accomplishing something by his art. He will be getting new ideas and points of view as to the cause and cure of disease.

Who does not now grow cold to the conventional list of causes of nervous disease:

"Exposure, trauma, shock, overwork, tea, coffee, alcohol and indigestion?" Will not a study of occupation, domestic life, training, childhood, microbic infection, heredity, change somewhat this list?

As nervous diseases are so largely social, it is necessary and enlightening for the neurologist to be on good terms with the social worker, the school teacher, the parent and eugenics. We take no small view of the function of neurology.

Entering his widest rôle, the neurologist has not only to be the diagnostician and the prescriber of drugs and diet, or surgery and mechanical therapeutics; but he has to be the educator and instructor of his patients. He has often to have the character and force and experience which will enable him to act to them "*in loco parentis.*" He must join with the teachers showing how children should be educated and taken care of while they study. He should follow them at the period of their youth and maturity, correct mental faults, advise them as to marrying, even marry them at times and tell them about the management of the children. He must help and uplift the religion of those who have any and give a religion or high and positive ideals to those who have not. He must show them how to live happily and to use with scientific efficiency the forces which nature has given them; which two things are often the same.

It is, in other words, necessary that we now proceed to develop a kind of social and economic neurologist as well as one of clinical and laboratory attainments. Modern civilization is carrying an enormous load of criminals and feeble-minded (and these two mean practically the same thing), of epileptics, insane and of the inefficient and pauper classes. We now can no longer be content with giving bromide to epileptics, or doing craniectomy on idiots, we must show the world how not to breed them.

There are certain social diseases which fill our clinics and which no doubt enormously help our practice, but it is somewhat our duty to help prevent the spread of these diseases, as well as to thrive by alleviating their results.

Thus, there are certain ethical standards and physiological methods which the neurologist must use to make himself a man equal to the highest tasks which he must undertake. He must be a kind of superman, one with higher ideals, more potent inhibitions and wiser in life and wider in outlook than those whom he is trying to guide.

With such a field before him, it is natural that we will disclaim before long the title of "specialists." We will be the broadest type of practitioners, if we take interest and assume responsibility along the lines of which I have spoken.

If we do not take this responsibility and raise our faces to the stars as well as turn our eyes upon the Weigert stain, we will become smart specialists, perhaps able to hunt out elusive tumors, to run to earth the rare and weird expressions of teratological defect, or delayed degeneration; but we will not count much in the councils of our art. The great things opening for us are to show how humanity gets its nervousness and how this can be prevented or handled. Here is an opportunity for zeal, industry, acumen, and for results that should be greater far than those which illuminate the neurological heroes of the past.

It is in the hope that I may kindle some feeling for the broader phase of neurology that I have written this, and I believe that the right spirit is abroad and is permeating the minds and hearts of the younger men.

Let me record my belief that the fatalistic doctrines of the eugenist do not make me lose heart, or feel lack of faith in the efficiency of good works, or power of self-control. Says the old poet: "One may be envious, passionate, indolent, drunken, sensual, yet no one is so savage that he can not be tamed if he lend a patient ear to culture."

The period of cultural study and cultural therapeutics is enormously needed now, it is coming and has rich rewards for those who pursue it.

Meanwhile, it seems to me that neurology will, to a degree and for a time, divide up into specialties of its own. There will be neurologists who are especially students of organic neurology; there will be functional neurologists, psycho-therapeutic and psycho-analytic, electro-therapeutic, epileptic, glandular, neuro-serological and laboratory neurologists. But the definite fruit of their special work will become systematized and absorbed in time by the general neurologist, who will come into his own as master of that highest branch of medical art which deals with the master-tissue of the human body.

ANTERIOR CRURAL NEURITIS

By Charles Metcalfe Byrnes, M.D.

INSTRUCTOR IN NEUROLOGY, JOHNS HOPKINS UNIVERSITY

Anatomy of the Anterior Crural Nerve

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If the word "neuritis" be used in its literal sense, to mean "inflammation of a nerve," it is obvious that the femoral, like all spinal nerves, may be the seat of an inflammatory state consequent upon some local disorder peculiar to its anatomical position, or as the result of a general systemic affection to which any peripheral nerve may be exposed. Hence, in order to discuss intelligibly the diseases of any particular nerve, some knowledge of its structure and anatomical relations is essential.

The anterior crural (femoral) nerve is the largest arising from the lumbar plexus, and is composed principally of fibers derived from the third and fourth lumbar roots, but in part also from the first and second. Within the dural cavity, the roots descend almost vertically for a distance of four or five vertebræ and contribute to the formation of the cauda equina. After making their exit from the vertebral canal, they unite within the substance of the psoas muscle to form the anterior crural nerve, which later emerges from the outer border of this muscle, in its lower part. The nerve then descends in a groove, between this muscle and the iliacus, to the front of the thigh, where it makes its superficial appearance below the ligamentum inguinale and to the outer side of the femoral vessels. Here it divides into its terminal branches which contain both sensory and motor fibers for the forepart of the thigh and the inner surface of the leg. Motor fibers are furnished to the following muscles: iliacus, sartorius, pectineus, and quadriceps femoris. The cutaneous nerves are distributed to the anterior surface of the thigh and the inner aspect of the leg, as far as the great toe. Nerve filaments are also given to the hip, knee and ankle joints.

This extensive anatomical distribution makes it evident that local diseases of many adjacent structures may secondarily affect the femoral nerve or its roots. Since these are mostly of a surgical nature, I shall not discuss them at length, but merely refer to them in so far as they may be of diagnostic aid.

Etiological Factors and Importance of Correct Differentiations

Within the vertebral canal, the more common disorders which may lead to neuritic symptoms in the femoral area are: Spinal cord affections, meningitis, tumors of the cauda equina, radiculitis, and vertebral caries. Of the many intra-abdominal diseases to be thought of, inflammatory states, new growths, aneurism, and psoas abscess are the first to suggest themselves. Since the nerve becomes more superficial as it enters the thigh, there are many surgical and traumatic conditions of the superficial and deeper structure which must be kept in mind; and, as many of them are readily disclosed upon careful inspection, it will not be necessary to enumerate them here. Injury to, or diseases of the structures within the trigonum femorale may readily implicate the fibers of the femoral nerve; and, in some cases, for a considerable time before the exact nature of the pathological process can be recognized. In this connection, Dr. Spiller has recently shown me a rare specimen containing many "peculiar loose bodies" removed from a cystic pelvic tumor appearing below the ligamentum inguinale. The patient had suffered for six years with "increasingly severe pain in the left leg, which had been variously diagnosticated as rheumatism, neuritis, aneurism, and osteosarcoma of the pelvis." With the increase in symptoms, a small swelling made its appearance in the groin, which suggested the probability of aneurism, thrombosis, osteosarcoma of the pelvis, or sarcomatous degeneration of the inguinal glands. Operation revealed a cystic tumor extending two inches below the ligamentum inguinale, and as far into the pelvis as the examining fingers could reach. A careful study of the case has been recorded by Drs. Willard and Spiller (1).

The more remote conditions which may affect the femoral nerve in this part of its course are: Exposure, overexertion, ill-fitting corsets, and, perhaps, certain occupations in which continued pressure is exerted upon the groin. Webber (2) has reported two cases in which mild neuritic symptoms were thought to follow the continued irritation from a heavy bunch of keys carried in the front pocket of the trousers. Other local disorders of the pelvis and lower extremity, but less intimately related to the femoral nerve, such as fractures and dislocations, osteomyelitis, and inflammations of the hip or knee joint, may secondarily produce degenerative changes in the nerve itself.

Besides these external or surgical diseases, there is a large group of distinctly medical disorders such as the infectious diseases, disturbances of metabolism, and the intoxications which figure largely in the etiology of various neuritides. In this group, however, it is more common to find the condition bilaterally symmetrical and widely distributed as a true polyneuritis; or, in some cases, confined to a single nerve plexus; as a mononeuritis multiplex or plexus neuritis. Occasionally, the inflammation may be limited to a single nerve; the radial, ulnar, sciatic, or peroneal being most frequently affected. Strangely enough, the femoral nerve, except as part of a true polyneuritis, is said to be affected rarely in any of these systemic diseases.

There is still a small group of cases which, in the light of our present knowledge, is entirely independent of any surgical or medical disorder. These are spoken of as primary, essential, or idiopathic neuritis, and are most commonly met with as affections of the brachial or sciatic plexus. Although primary neuritis in any location is comparatively rare, as a disease of the lumbar nerves, it is regarded as among the rarest affections.

It is apparent, then, that sensory or motor disturbances in the distribution of the femoral nerve may be due to a variety of pathological processes of widely different nature; all of which must be excluded before a diagnosis of primary femoral neuritis is to be considered. While the same precaution is to be observed in the interpretation of neuritic symptoms elsewhere, it is especially important in affections of the lumbar nerves, since it is well known that pain or slight motor weakness confined to their distribution may be, for a long time, the only indication of a more serious intraspinal or vertebral disease. This is particularly true of cauda equina tumors, where the symptoms may be confined entirely to one side for many weeks or even months. An instructive article by Spiller (3), upon tumors of the cauda equina, contains the report of a case (No. VIII) which illustrates some of these features. The patient, when first seen, had suffered for one year with pain about the right knee, which later extended to the front and outer side of the thigh. There was atrophy of the thigh muscles, but no rectal or vesical disturbances. At no time was there any pain in the right sciatic nerve, or in any part of the left leg. With the exception of slight remissions, the condition remained about the same during a period of four years, in spite of the fact that the external cutaneous nerve (N. cutaneous femoris lateralis) had been cut. It was thought that a small non-malignant tumor (osteoma) implicating a few nerve roots might explain the symptoms in this case. The spinal canal, however, was not explored. Dr. Spiller tells me that the patient has since recovered, and he is inclined to think that the case may have been one of neuritis. Such observations as the above, together with the prevailing opinion concerning the rarity of femoral neuritis, only serve to caution one in making a diagnosis of the latter condition. The interpretation of symptoms, then, in any given case, becomes increasingly difficult because of this teaching and a natural reluctance to diagnosticate an extremely rare condition, when any one of many well-known, but temporarily obscure disorders might be present. From my personal experience with an obscure case of femoral neuritis in which these perplexities were introduced, I have been led to make a study of the frequency of this affection in the hope of supporting my belief that the disease is more frequent than it is thought to be; for I can see no logical reason why the lumbar nerves should be any less susceptible than are those of the brachial or sacral plexus.

CLASS OF CASES TO BE CONSIDERED, WITH A CRITICAL REVIEW OF THE LITERATURE

It was my original intention to confine this study entirely to primary crural neuritis, but my search of the literature disclosed so many interesting conditions in which this nerve is alone affected, that it seemed instructive to make the theme more inclusive. Accordingly, I shall discuss under this title, all cases in which one or both nerves has been the seat of an inflammatory state consequent upon internal or medical diseases, as well as those of a so-called idiopathic nature. The more familiar forms dependent upon distinctly local or surgical conditions, together with those accompanying the true polyneuritides, have been excluded.

Every statistical investigation is necessarily beset with certain inaccuracies and open to some degree of criticism. In this particular study it has been especially difficult to obtain exact information concerning the frequency with which the femoral nerve is affected, because of the slight attention which has been given the subject by medical writers and the variable classifications it has received in medical bibliography. Such information as I have acquired was obtained, first, from a review of many text-books upon neurology and medical diagnosis, which only demonstrated that the subject was either dismissed with a few words or entirely disregarded. Secondly, both series of the Surgeon General's Index Catalogue, and the entire edition of the Index Medicus were carefully referred to under the following headings and subdivisions: *diseases of nerves,* and *of lumbar plexus; paralysis of nerves* and *of lumbar plexus; neuritis of lumbar plexus;* and *neuritis.* The titles of many of these references were either misleading or inadequate; hence, in every instance, the original article was consulted, unless the title clearly stated the discourse to be upon multiple neuritis or neuritis due to some distinctly local, surgical disease. Thus, while it is probable that a few cases may have been overlooked, I believe that this report is a fairly complete résumé of the literature up to the present time. It will be instructive to give an account first of the opinions expressed in medical text-books, and relate subsequently what is to be learned from the periodical literature.

Certainly, the affection cannot be very common if one is to accept the experience of such authors as Schultze, Sir W. Gowers, Oppenheim, and M. Allen Starr. The 1898 edition of Schultze's (4) book dismisses the subject with these words: "Alleinige Neuritis ist selten. Einmal sah ich eine einseitige Cruralislähmung bei einem jungen Manne, ohne das irgend Ursache auffindbar war." He refers to two more cases of a surgical nature, and mentions the three reported by Bruns. Sir William Gowers (5), writing of diseases of the lumbar plexus, says: "It is occasionally the seat of spontaneous neuritis," and in gouty or rheumatic patients the "anterior crural or a branch suffers most frequently." In the fourth volume of an otherwise comprehensive work by Cestan-Verger (6), the simple statement that "c'est exceptionnellement que le nerf crural est le siège d'une névrite de cause interne" is all that is said upon the subject. Oppenheim (7), in the fifth edition of his text-book, writes more at length and appears to be more familiar with the literature upon the subject. From one of his experience, however, the following statement is rather convincing: "Auf infektiöser Grundlage entwickelt sich die isoliert Lähmung des N. cruralis nur äussert selten. Eine primäre spontane Neuritis des Cruralis hatte ich nur zweimal konstatieren Gelegenheit, sie wurde in dem einen Falle auf Durchnässung zurückgeführt. In dem andern war sie gichtischen Ursprungs." In America, the opinion of Starr (8) emphasizes still further the extreme rarity of the disorder. Of the text-books which have appeared since 1910, those by Albutt and Rolleston (9), Turner and Stewart (10), and Lewandowsky (11) have been consulted, but contain no additional information. Gordon Holmes (12), writing in Osler's "System of Medicine," after mentioning one or two instances in which the crural nerve was affected, concludes that: "Isolated paralysis of the lumbar plexus is extremely rare, and merits no further reference." A study of the periodical literature, however, has disclosed some interesting features of crural nerve affections which have apparently escaped the notice of those who have written more at length upon diseases of the nervous system.

The earliest published account of what appears to be an isolated affection of the crural nerve is to be found in the thesis by Descot (13), published in August, 1822. Referring to nervous affections of the lower extremity, he states that neuralgia in this location most frequently affects the sciatic nerve, but that sometimes the crural or anterior femoral may be involved. The most pronounced symptom is pain, but "cette maladie puet causer la paralysie et l'atrophie des parties affectées." It will be recalled that during this period, the exact pathology of peripheral neuritis was not clearly understood. In fact, it was not until the publication of Dumenil's paper in 1866, that the inflammatory nature of certain nerve palsies was demonstrated. Thus, while Descot does not use the word "neuritis," there is little doubt that he had reference to a condition which is now designated by that term. Two years later, Benedikt (14) reported a case in which there were decided symptoms of crural neuritis following an attack of typhoid fever, and a similar observation was recorded by Krafft-Ebing (15) some time later. Erb (16) is the first to have attached any clinical importance to the disorder. Writing upon paralysis of the crural nerve, in *Ziemssen's Handbuch,* for 1874, he states definitely that "ferner, ist Neuritis eine nicht seltene Ursache der Cruralislähmung." The following year, Bannister (17) reported the "History of a Case of Idiopathic Subacute Neuritis Affecting the Crural, Obturator, and Sciatic Nerves." "Its interest," he says, "is in the comparative rarity of the affection in its well-developed form." During the succeeding twenty years, that is, up to 1895, affections of the femoral nerve were more frequently recorded, and are to be found among the monographs by Winckel (18), Buzzard (19), Caradec (20), Bernard (21), Moeli (22), and others. Since this time twenty additional cases have been reported among the complications of various medical diseases, and will be referred to later under appropriate subdivisions. As a primary condition, however, little attention was given the subject until the publication of the paper by Waterhouse (23) in 1910.

AN ANALYTICAL STUDY OF 136 CASES, GROUPED ACCORDING TO ETIOLOGY

It will be convenient to treat these affections and the diseases with which they have been associated, in the following order:

Metabolic diseases, infectious diseases, septic conditions and intoxications, local conditions in which circulating toxines may have been a factor, and primary idiopathic neuritis.

Metabolic Diseases

Gout.—The nervous manifestations accompanying irregular gout may be merely vague neurasthenic states, indefinite muscle cramps, paresthesia, or even well-defined neuritis. Neuralgic disturbances in the course of the sciatic nerve are the most common peripheral nerve symptoms, and have not infrequently led to a definite sciatic neuritis. Jonathan Hutchinson (24) is the first, so far as I know, to have called attention to a definite crural neuritis of gouty origin. In reporting his case he makes the following introductory statement: "The anterior crural nerve is, I believe, very rarely affected, and the case to be narrated is almost the only example of it in a severe form which I can, at present, remember to have seen." Eight years later, Bernhardt (25), in discussing crural paralysis, says that gout is sometimes the cause, but gives no illustrative case. Luff (26), in his "Gout, Its Pathological Forms, Diagnosis, and Treatment," is of the opinion that brachial and sciatic affections are more common, although "in sciatica of gouty origin the affection is not always confined to the sciatic nerve alone; frequently the crural nerve is simultaneously involved, and under certain circumstances the obturator nerve is also affected." He mentions no specific case. The second, and only other, case of crural neuritis in the gouty is referred to by Oppenheim in his text-book upon diseases of the nervous system. Among the cases reported by Waterhouse (23) there are two in which there was a previous history of gout, but in these two there were other more recent and active etiologic factors which exclude them from this group. I have found, then, only two well-defined instances of the condition among the gouty. Cassirer and Bamberger (27) refer to a case reported by Riegel, in which the affection was bilateral, but I have not been able to find the original account.

Rheumatism.—It is not the purpose of this paper to attempt an exposition of the term "rheumatism," nor am I prepared to say what interpretation was made of it by Dr. Buzzard (19) when he ascribed it as a cause of the neuritis in his "Cases of Neuritis," published in 1878. In one instance, the sciatic nerve was the seat of the attack, while in the other there were symptoms in the distribution of the ilio-inguinal, ilio-hypogastric, obturator, anterior crural, and other branches of the lumbar plexus upon the right side. The most pronounced symptoms, however, were in the course of the femoral nerve, and there was slight involvement of the same nerve upon the opposite side. Although he regards rheumatism as the exciting cause, there was the additional factor of exposure to all kinds of weather. Neuritis has not infrequently been said to have a rheumatic basis, but this is the only instance, of which I am aware, in which the crural nerve has been affected.

Diabetes.—Osler (28), writing of the nervous manifestations of diabetes, in his "Practice of Medicine," calls attention to the fact that minor neuritic symptoms, such as numbness, tingling and pain, are not uncommon. While the neuritis may be general of the upper or lower extremity, it may sometimes be unilateral, or even limited to a single nerve—"the sciatic or third nerve." Bernard (21) published in 1882, so far as I know, the first case of isolated femoral neuritis occurring in a diabetic. "These monoplegias," he states, "are not infrequent in diabetes and may occur in various nerves. They are usually transitory and incomplete." Whether the loss of the knee jerks, which is not of uncommon occurrence in diabetes, is in reality dependent upon a mild neuritic process or not, is still a matter of dispute; they may be lost, however, without any other manifestation of a neuritic affection. The next article calling attention to diabetic affections of the femoral nerve, was published by Bruns (29), in 1890, when he reported three cases. In not all of them, however, was the disease strictly limited to a crural nerve. In one instance the condition was obviously a lumbar neuritis. Bilateral femoral involvement was observed in the second case, which first appeared upon the right side, and later affected the left thigh, after the right had recovered. The third case was most probably sciatic neuralgia with secondary involvement of the crural nerve. Two years later, Eichhorst (30) reported an observation in which the condition was bilateral and confined to the femoral nerves. Anatomical examination showed the central nervous system to be practically normal, but a study of the peripheral nerves demonstrated that "hier bestand an beiden Cruralnerven eine sehr beträchtliche parenchymatöse Neuritis." The sciatic nerves were only slightly altered and showed no clinical evidence of their involvement. Later, Williamson (31), in 1898, and Waterhouse (23), in 1910, reported each two cases. The former refers to a case recorded by Auche, and the three cited from Bruns, but is of the opinion that pronounced neuritis is not common in diabetes. One other instance has been recorded, by Salmon (32), in which the symptoms were decided, and confined to the right femoral nerve. There are to be collected from the literature, then, ten cases in which the crural nerve, alone or together with one or more branches of the lumbar plexus, has been involved, upon one or both sides, in the course of diabetes. If Auche's case, which I did not have an opportunity to abstract from the original, be included, there is a total of eleven cases.

Pentosuria.—Although diabetic patients may, at times, show the presence of pentose in the urine, it seems quite clearly established that pentosuria is an independent condition, and may frequently lead to no characteristic clinical symptoms. Cassirer and Bamberger (27) have made a careful laboratory and clinical study of a case of pentosuria in which there were characteristic symptoms of bilateral femoral neuritis. Besides the presence of pentosuria, there was a history of marked alcoholic excess. While the majority of alcoholic neuritides are of the symmetrical or polyneuritic type, attention is called to the fact, by Dr. Buzzard (33), that it is not uncommon to find among them a definite menoneuritis. It is possible, then, that this case may have been of that origin.

Infectious Diseases

Typhoid Fever.—Two cases have already been referred to among the complications of typhoid fever—one reported by Benedikt (14), the other by Krafft-Ebing (15). In the former, the right side alone was affected, and the muscles on the front of the thigh were paretic and atrophic. In Krafft-Ebing's case, the adductors of the left thigh were weak, and there was pain along the course of the great saphenous nerve. Reference is also made to another patient, in whom there were observed slight sensory disturbances upon the front of the thigh, but unaccompanied by other symptoms suggestive of neuritis. The extensive observations of Ross and Bury (34) do not contain a single instance in which the crural nerve, alone, is affected. They state, however, that the great saphenous nerve is sometimes involved, and that the crural nerve not infrequently suffers along with other nerves of the lower extremity. Monoplegias, they believe, are not uncommon in typhoid fever, and at times the paralysis, when in the lower extremity, is "limited to a certain muscle or group of muscles, and often is strictly confined to the territory of a particular nerve."

Tuberculosis and Syphilis.—Neuritis associated with tuberculosis is not of common occurrence, and I believe that up to the present time it has not been demonstrated that the condition has been due to definite tuberculous deposits in the peripheral nerves. Occasionally, however, multiple neuritis or plexus neuritis has been observed in advanced cases of tuberculosis in which there were evidences of toxemia and cachexia. Remak and Flatau (35) have furnished an account of the only case of isolated crural neuritis which, so far as I know, has been associated with general tuberculosis. The affection was unilateral and upon the right side. There were pain, numbness, and atrophy on the anterior aspect of the thigh and marked tenderness upon pressure over the crural nerve. Anesthesia was not marked, but sensation was slightly altered along the front of the thigh and inner side of the leg as far as the internal malleolus.

Syphilitic neuritis, except of the cranial nerves, is not frequently observed, and gummatous involvement of the peripheral nerves is not of common occurrence. The following case, reported by Caradec (20), although due to a local disease of the nerve, is of interest because of its infrequency. There was pain in the region of the right internal saphenous nerve, and following its course there were brown pigmentations of the skin. A series of nodular enlargements could be felt along the course of the nerve trunk. Specific medication was followed by relief.

Septic Conditions and Intoxications

Chronic Suppuration.—Two observations have been recorded in which the femoral nerve, alone, has been the seat of a neuritis consequent upon prolonged inflammatory conditions in distant parts of the body. One was reported by Bernhardt (36), in

1906, in which there was bilateral crural palsy following long-continued liver abscess. Bernhardt is of the opinion that the crural nerve is not infrequently the seat of a true neuritic process similar to that observed in other nerves during the course of typhoid fever, diphtheria, diabetes, etc. The second case is recorded by Schultze (4), in which there was bilateral crural involvement following chronic osteomalacia.

Alcohol.—Since the appearance of Buzzard's article calling attention to the occurrence of mononeuritic symptoms in chronic alcoholism, Remak and Flatau (35) have made similar observations in cases of autotoxemia (gastro-intestinal), plumbism, and alcoholism. In one instance they found, in a confirmed drunkard, weakness and electrical changes in the left quadriceps muscle associated with pain in the distribution of the left femoral nerve. The affection remained unilateral and confined to the territory of the crural nerve, and is, I believe, the only observation of its kind among the alcoholic neuritides. Some time previously, Moeli (22) reported the case of a profoundly alcoholic patient who had, several times, suffered with delirium tremens and during the last attack developed a bilateral femoral neuritis. Although, in this instance, the condition may be regarded as a true symmetrical or polyneuritic affection, its definite limitation to the femoral nerves will justify its inclusion as a case of bilateral mononeuritis.

There is still another group of cases closely associated with toxic conditions in which, however, the probability of a local etiological factor is so prominent that I have hesitated to include them among the neuritides of internal origin. Nevertheless in view of their especial interest to the surgeon and obstetrician, together with the possibility of their toxic nature, it seems proper to include them in this study, and I shall refer to them as:

Local Conditions in Which Circulating Toxines May be a Factor

Appendicitis.—It is only within the last decade that appendicular neuritis has received attention in medical literature. The first case was reported by Raymond et Guillain (37) in the *Semaine Médicale* of 1905. The patient was the subject of chronic appendicitis and had suffered from four acute exacerbations. Within ten days following the onset of the first attack, there was pain in the course of the right femoral nerve, which subsided as the inflammatory symptoms disappeared. During each succeeding attack the neuritic symptoms were increased; and, later, weakness, wasting, and reflex changes made their appearance in the distribution of the crural nerve, together with slight pain in the right and left sciatic nerves. Following the fourth attack, appendectomy was performed. The appendix was found to be retrocecal in position and fixed by numerous adhesions, but free from any suppurative or gangrenous condition. The authors are of the opinion that the appendix is not infrequently intimately related to the psoas muscle and femoral nerve. Their explanation, however, of the manner in which the process extended to the left sciatic nerve does not appear to be well founded. The opinion is expressed that extension occurred by way of the right lumbar and sacral roots through the spinal canal to those of the opposite side, or perhaps, by way of the retroperitoneal lymph channels. While the initial symptoms may have been due to direct implication of the nerve trunk, it is more probable that extension to the left side resulted from the transmission of toxic material through the lymphatics or the general vascular system. It is interesting in this connection, that Marcou (38), during the same year but somewhat later, recorded a case of neuritis of the "cubital" nerve in association with appendicitis. Cerebral abscess, meningitis, convulsions, and various psychic disorders have also been reported among the nervous affections accompanying appendicitis.

.The second case was reported by Courtellement (39) three years later. Two days after the onset of the appendicular symptoms the patient complained of pain on the front of the right thigh, which continued for about four weeks, when both the neuritic and appendicular symptoms began to subside. This left the patient, however, with some weakness in the right leg, difficulty in walking, and slight sensory changes in the course of the anterior cutaneous nerves of the right thigh. Appendectomy disclosed a chronically inflamed appendix in the immediate neighborhood of the anterior crural nerve. A third case is referred to by Gilbert Ballet, who, in discussing Courtellement's paper, mentions having seen a similar case several years previously, but could find no explanation for it until the appearance of Raymond's article.

Apelt (40) published in 1909 an account of the fourth case. Three days after the onset of the appendicular attack there was pain in the distribution of the right crural nerve, followed by weakness, wasting, and slight sensory changes. In the discussion following Apelt's report, Schlesinger refers to a similar case which he had previously observed, in which the neuritic symptoms preceded the appendicular manifestations, and prevailed as the most predominant feature of the attack during a period of six months. The sixth case has recently come within my own experience, and will be referred to more fully in another section.

In the three published cases the most prominent features are the early appearance of the neuritic symptoms, presence of sensory changes, weakness, wasting, electrical changes, and altered knee jerks. Whether the affection is entirely due to a local inflammatory condition and direct involvement of the nerve, or to the absorption of toxic substance must, for the present, remain undetermined. The fact that all cases have first affected the right side indicates the greater probability of a local condition, although the left-sided affection and the cubital nerve involvement must rest upon some other explanation.

Prolonged Surgical Anesthesia.—Radial, brachial, and peroneal palsies have long been recognized among post-surgical complications as the result of faulty positions of the arm or leg during extensive surgical operations, or from an improperly applied ligature or bandage for hemostatic purposes. Crural paralyses from such causes, however, have been extremely rare, and only within recent years have they been added to the list of surgical complications.

Gumpertz (41) is the first to have reported a case of this nature. His communication to the *Berliner Gesellschaft für Psychiatrie und Nervenkrankheiten* in 1895 relates the case of a patient who had been subjected to a gynecological operation under ether narcosis. The legs were strongly flexed upon the abdomen (Simm's position) and the operation was of several hours' duration. Upon regaining consciousness the patient complained of pain and weakness in the right leg, and objectively there were found paralysis of the right quadriceps and ilio-psoas muscles, thermanesthesia on the front of the thigh, and tenderness along the course of the crural nerve. Gumpertz thinks the condition was due to pressure upon the lumbar nerves from the strongly contracted psoas muscle. It seems to me, however, that in this particular position the psoas muscle would be more probably in a relaxed condition. In 1897, Garrigues (42) reported a similar observation in the case of a patient upon whom a vaginal hysterectomy had been performed. Narcosis was of two hours duration. Three days after the operation there were almost total insensibility in the distribution of the left crural nerve, and paralysis of the entire left leg, both in the lumbar and sciatic distribution. A Rabb bandage had been applied, and the author thinks this may have accounted for the sciatic involvement, which was limited almost entirely to that portion of the nerve below the application of the bandage; while the crural involvement, he thinks, was due to the extreme flexion of the hip. A third case is recorded by Klempner (43) in 1906, in which he refers to the two cases already cited and relates his personal observation. After remarking upon the rarity of crural paralysis in general he describes the case of a woman who had undergone a gynecological operation of three and a half hours' duration. The legs were flexed, abducted, and rotated outward. Following the operation, evidence of crural involvement appeared, in which pain, tenderness along the nerve trunk, weakness, and atrophy were the prominent features. He is of the opinion that the condition was due to faulty position, together with the toxic effects of the anesthetic, and refers to a similar case reported by Turney; but does not state where it was recorded, and I have been unable to find the original.

There are some rather striking and common features in these three cases. All have occurred in patients who have undergone gynecological operations of a rather extensive nature, and all were placed in similar operative positions. There was marked paralysis in each case, and in all three the sensory changes were pronounced. The affection was upon the left side in two instances, and once upon the right side. No doubt faulty position must have been an important factor in the etiology of the condition, but, as Klempner suggests, there may have been some toxic state from the general anesthesia, which, together with lowered resistance and faulty position, may have been responsible for the condition.

Obstetrical Conditions.—Neuralgia and paralyses are not infrequent post-partum complications, and a review of the literature upon crural affections teaches that these conditions are far more frequent as a result of childbirth than in any one or all other medical or surgical disorders. Their frequency, then, together with the observation that some factor other than mere mechanical pressure might be responsible for the condition have led me to include them in this monograph. Altogether, eighty-four instances of anterior crural nerve affection have been recorded among the nervous complications of puerperal states.

The disease was first described by Winckel (18) in 1878 among the "neuralgias and paralyses of the lower extremity" occurring during confinement. There is little doubt that he is writing of the same condition described later by Meyer, to whom has been accredited the first account. Although Meyer recognized Winckel's report, he seems to have some doubt as to the neuritic nature of the affection he describes. Winckel furnishes the detailed report of one case in which, after confinement, there were evidences of crural nerve involvement, and remarks that: "So findet sich öfter eine Neuralgia cruralis bei Wöchnerinnen welche mit starken Schmerzen an der äussern oder innern Seite des einen Oberschenkles, meist nur bis zum untern Drittheil desselben, auch wohl bis zum Knie verbunden ist und im N. cutaneus anterior externus oder medius ihren Sitz hat." The affection may be confined to one side, or both may be involved, and there are sensory changes, pain, tenderness of the nerve trunk upon pressure, wasting, and atrophy. The etiological factors may be: Pelvic exudates, small extravasations in the vicinity of the affected nerve, or hyperemia and edema of the nerve itself. Mechanical injury is also a frequent cause.

Ernst (44) reported, later, a number of similar cases of a much milder nature and of shorter duration. In 800 obstetrical cases he met the condition 30 times. It appears usually within a few days after delivery, may be unilateral or bilateral, and is marked by pain in the course of the anterior crural nerve and tenderness upon deep pressure over the nerve trunk. There are no sensory changes, although there is a moderate degree of motor paralysis. The disease is more frequent in primiparæ, is always accompanied by a slight rise in temperature, and usually is of eight or ten days' duration. Intoxication from the use of antiseptics and post-partem infection were excluded in each case.

Probably the first systematic account of the condition was furnished by Meyer (45) in 1901, when he reported his experience with 1,000 obstetrical cases. Of this number, 17 were affected with some post-partem disturbance in the crural nerve. Meyer cautiously refrains from making a positive statement as to the nature of the ailment, when in the title of his paper he uses the word "neuritis" with a question mark, his objection to the term being the short duration of the illness. The symptoms observed, however, in his cases are quite suggestive of a neuritic process. The affection usually makes its appearance within the first two or three days after confinement and is characterized by pain about the knee and anterior surface of the thigh, marked tenderness upon pressure over the nerve at its exit below Poupart's ligament and upon passive movements of the thigh, and definite weakness in voluntary movements of the thigh upon the abdomen. Though absent in some cases, there is usually a slight rise of temperature—0.10 of a degree. Of the 17 cases, 13 were in primiparæ, 3 in IIparæ, and 1 in IIIparæ. The affection was bilateral in seven instances, and unilateral in ten. Of these ten cases, the right side was affected 5 times; the left side 4 times, and in one instance not mentioned. He records no observations upon the sensibility or condition of the knee jerks. The etiology, he confesses, remains obscure after the elimination of the more common factors, such as mechanical interference, intoxication from the use of antiseptics, post-partem infection, pressure from pelvic exudates, and the toxemia of general anesthesia.

A later publication from Hauch (46) also emphasizes the frequency of the condition. In a series of 680 obstetrical cases he found neuritis of the crural nerve 32 times. The symptoms were quite similar to those already related, except for the presence of slight sensory changes. In all of these cases the affection made its appearance shortly after delivery—sometimes within a few hours—and was of short duration, mostly eight or ten days, the longest being twenty days. Hauch is of the opinion that the disorder depends more upon the condition of the mother than upon the size and position of the child. Instrumentation was resorted to only once in his series, and although admitting the impossibility of excluding some mechanical factor, he feels that the affection does not depend upon this alone, but probably a combination of physical and chemical (toxic) agents.

Four additional cases are found in the "Thèse de Paris" by

Routhier (47) which contains a full bibliography and detailed account of the clinical symptoms. The author is of the opinion that the affection is probably neuritic, although in some cases there may be a true radiculitis. His objections to regarding the condition as a true neuritis are absence of reaction of degeneration and the presence of increased knee jerks. There were, however, slight sensory changes. The crural nerve is affected in about 4 per cent. of all cases of confinement and is most probably due to some toxic substance—uterine absorption of placental toxines (Hauch).

While there are many mechanical and inflammatory conditions accompanying childbirth which may readily affect the crural nerve, it seems that most of them have been excluded by those who have studied the subject. Although it is difficult to exclude pressure of the presenting part upon some portion of the birth canal, if this were the only factor it is quite likely that the lumbar or sacral nerves would be more frequently affected. The slight rise of temperature in most cases, suggestive of a mild toxic state; the necessary circulatory disturbances accompanying pregnancy, and possibly some form of auto-intoxication, might all unite to form a group of etiological factors. At any rate, the observations are interesting and the frequency of the disorder, with the probability of its toxic nature, are sufficient to encourage further study in this direction.

Unclassified Conditions

There as still a few scattered cases throughout the literature in which the etiological factors are so uncertain and diversified that they do not permit of a systematic classification, and I shall dispose of them under the above heading as isolated instances of anterior crural neuritis.

Attention has already been called to the general belief that, because of its well-protected position, from cold, exposure, and climatic conditions, the lumbar plexus is rarely the seat of an inflammatory state.

Exposure, however, has been accredited with five instances of lumbar or crural neuritis. In three cases, Waterhouse could detect no other probable cause than exposure. Two of his patients were laborers, and constantly exposed to all conditions of weather. The third patient was a physician, who, after a thorough "wetting," complained of pain and weakness on the front of the right thigh and slight pain in the sciatic area. The other two cases are reported, one by Bannister (17), in which the affection made its appearance shortly after prolonged exposure to cold; and the other, by Oppenheim, in which the disease followed a thorough wetting.

Occupation and Overexertion.—Each of these has been assigned an etiological rôle in the production of neuritic affections of the lower extremities. Cassirer (48) in the *Deutsche Klinik* for 1906, after remarking upon the extreme rarity with which the lumbar nerves are affected, relates the history of a case of left crural neuritis occurring in a coppersmith, whose occupation necessitated that the left leg be held, for long periods, in one fixed position accompanied by frequent bending of the trunk forward and backward. The patient finally sought relief because of pain, numbness, and weakness of the left thigh, which had persisted for more than a year. Remak and Flatau (35) call attention to another case which might well be included under occupational causes, although the nature of the employment is not stated. The patient was a male whose work necessitated standing on the feet for long periods of time. For six months he had complained of pain and numbness on the front of the left thigh. The muscles of this region were found to be atrophic, and there were sensory changes and electrical disturbances. They have also observed neuritis of the right crural and obturator nerves in a patient whose occupation was that of typesetter. There was a previous history of a left ulnar neuritis, but no evidences of plumbism. Whether this particular case can be attributed to occupation, alone, is difficult to determine, since the exact nature of his employment is not given. No doubt, if the typesetting were done by hand, or the machinery of the printing-press manipulated by foot-power, there may have been an occupational element in the etiology, but it is not improbable that lead may have been a contributing factor.

The only case definitely attributed to overexertion is mentioned by Bernhardt (25) in Nothnagel's "Special Pathology and Therapy," 1895. He does not state the nature of the overexertion, nor whether the condition was unilateral or bilateral. And, finally, one instance has been mentioned by Oppenheim, in which there was congenital bilateral weakness of the crural muscles.

Primary or Idiopathic Anterior Crural Neuritis

It will not be necessary to review the many processes of elimination which must be employed in order to arrive at a diagnosis of primary or essential neuritis, although some statement should be made concerning the method which has been used in the selection of cases to be included under this heading.

In many of the recorded cases the author, although assigning no cause for the disease, has not made it quite clear as to just how far his search for an etiological factor has extended, or else it has simply been stated that " no cause " could be determined, meaning, no doubt, that none of the usual causes of neuritis were ascertained. In some instances the cause was attributed to "cold," "exposure," "thorough wetting," or following a fall. None of these cases, however, will be included under this heading, as they have already been discussed under "unclassified conditions." If any, even remote etiological factor has been mentioned as a probable source of the malady I have made the effort to classify it under the appropriate heading. Hence, the group of cases to be discussed presently includes only those in which the author, regardless of the thoroughness of his effort to determine the cause, has definitely stated that no explanation could be found. In some cases, the examination has been most complete; in others, there is the probability that if the search had been more careful than the record would suggest some causative factor might have been detected. Including the report of my personal observation and those collected from the literature, I have the records of eight cases in which the anterior crural nerve has been the seat of an idiopathic inflammatory condition.

Schultze is the first, so far as I am aware, who refers to the disorder as a primary condition. Reference has already been made to his observation. He merely states that he has seen one case in a young man in which the crural nerve of one side was affected, and "ohne das irgend eine Ursache auffindbar war." In 1900, Hartmann (49) reported, in detail, the account of a case occurring in a man fifty years old, whose past history was entirely negative, and who had had no recent illness. The characteristic symptoms were present: pain, weakness, wasting, and sensory disturbances in the distribution of the left crural nerve. The knee jerk was not obtained upon the affected side. He states that "no definite cause could be determined" and eliminates such conditions as vertebral disease, trauma, alcohol, diabetes, and lues. The patient finally recovered. In the next case, Coclet (50) simply remarks that the condition made its appearance in a man some time after a fall (à la suite d'une chute), but does not describe the nature of the injury nor does he mention the side which was affected. There were pain and atrophy in the crural distribution. Stretching of the nerve by open incision was practised and afforded complete relief. At operation, the crural nerve was found surrounded by numerous adhesions of connective tissue. Two additional cases were reported in 1907, one by Dumolard (51), the other by Jeanselme and Sézary (52) four months later. In the first instance the pain was confined almost entirely to the distribution of the right crural nerve. It was of a continuous paroxysmal character and increased by movement of the part, and the atrophy and sensory changes were characteristic. The patient had not drunk alcohol for twelve years and there was no history of gout or lues, although the wife had had one miscarriage and two children had died in infancy. The spinal fluid showed marked increase in the number of white cells. The urine contained no sugar or albumen. While syphilis is strongly suspected in this case, the author states that the cause remained obscure. The case recorded by Jeanselme and Sézary is quite similar to the one I wish to report from my personal observation. The patient had had no recent illness; the past habits and history were good; and there was no evidence of lues. He suddenly experienced pain in the left loin and leg, and one month later the nerve was tender upon pressure; there were marked sensory changes and some wasting of the muscles; and the left knee kick was markedly diminished. The urine and spinal fluid were negative. Following a course of biniodid therapy there was marked improvement.

(*To be continued*)

AN ANALYSIS OF THE ERRORS IN DIAGNOSIS IN A SERIES OF SIXTY CASES OF PARESIS[1]

By Samuel T. Orton, M.D.

In reviewing a series of cases of general paresis from the standpoint of the distribution of the lesions[2] a number of cases were encountered in which the clinical diagnosis of general paralysis was not substantiated by the microscopic examination of the cortex and this review has been undertaken for the purpose of analyzing the errors.

At present the routine at the Worcester State Hospital includes a Wassermann examination of the blood serum of all new cases followed by lumbar puncture of all those showing a positive reaction in the serum. A Wassermann test is made on part of the fluid and the remainder is used for the Ross-Jones test, the Noguchi butyric acid test, a cell count and a differential cell stain by the Alzheimer method. The cases here reviewed, however, were all cases coming to autopsy before this routine was adopted, a point which must be borne in mind in considering the diagnostic error. A similar analysis of a series of cases in which a complete serological examination has been made would be of value in determining the reduction in the error when these data were included and would emphasize the need of such examination for accuracy in even routine diagnosis of paresis.

Southard in 1910 has reviewed a similar series at the Danvers State Hospital with a result of 15 per cent. of diagnostic error in a series of 41 cases which were unanimously considered by the Danvers staff as clinically certain.

In the present series are included all cases which came to autopsy at the Worcester State Hospital bearing the clinical diagnosis of general paralysis during the years 1910 to 1912 inclusive, a total of 60 cases. The final diagnosis rests on the plasma cell criterion in sections prepared in paraffin by a modification of the Nissl method. Nine of the 60 cases failed to show the lesions of general paralysis while characteristic findings were encountered in one case of a remainder of 116 autopsies (176 minus 60 paretics) in which paresis was not considered antemortem.

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[1] From the Laboratory of the Worcester State Hospital, Massachusetts.

[2] To appear in the *American Journal of Insanity.*

This case of negative error bore the diagnosis of acute alcoholic mania with hallucinosis. He was an Irishman of 43 with a negative family history who had used alcohol in moderation, but was very susceptible to it. At the age of 32 years he had a mild attack of delirium tremens. No venereal history. Onset of psychosis was sudden, eight days before death, with psychomotor excitement, confusion, insomnia, auditory and visual hallucinations and some expansive ideas. His hospital residence of 7 days was a very turbulent one marked by violence to himself, to the attendants and to other patients, and on the third day he was found to have a broken jaw and several broken ribs. His violence precluded a careful physical examination. Pneumonia and signs of sepsis preceded the end. The autopsy revealed a double fracture of the jaw, a fracture of the sternum and several ribs with pus accumulations about several of the fractures and some consolidation in the lungs. The brain showed marked engorgement of the pial and cortical vessels, some pial milkiness and slight granular ependymitis. These lesions, while suggestive, were not of sufficient grade to establish the diagnosis of paresis from the gross examination. The microscopic picture, however, leaves no doubt as to the diagnosis.

The nine cases of positive error which form 15 per cent. of the total series are here given in tabular form.

More complete abstracts of the clinical records and of the autopsy protocols are included here.

Case No. 1. Autopsy No. XV–54. White male, 45 yrs. old; born in Ireland. No family history. Alcoholic excesses up to five years ago, since when he has been an inmate of an almshouse. Toward the end of this period mental and physical enfeeblement appeared and he was committed to the hospital. Advanced dementia. Untidy, somewhat resistive, irritable. Unable to stand or walk or talk so that he could be understood. Physical examination showed contracted unequal pupils which did not react to light, but with some reaction on accommodation. Face asymmetrical and apparently drawn to the left. Tongue deviated toward left with tremor. Tremor of hands on extension and rotation. Knee jerks exaggerated and unequal. Ankle clonus was present on left. Six distinct punched-out circular scars on glans penis.

No.	Aut. No.	Age	Duration	Hospital Residence	Clinical Evidence	Final Diagnosis
1	XV-54	45	5 years.	2 months.	Dementia. Increased knee jerks. Ankle clonus. Argyll-Robertson pupils.	Probably alcoholic deterioration.
2	XVI- 3	26	2 weeks.	7 days.	Maniacal excitement ending in stuporous delirium. Reflexes diminished. Preputial scar.	Probably typhoid delirium.
3	XVI-11	34	10 months.	17 days.	Dementia. Argyll-Robertson pupils. Increased knee jerks.	Cerebral syphilis.
4	XVI-13	28	16 months.	10 days.	Delusions of grandeur. Motor excitement. Insomnia. Preputial scar. Diminished knee jerks.	Probably dementia præcox.
5	XVI-21	54	?	13 days.	Dementia. Sluggish pupils. Marked tremors of tongue. Preputial scar.	Organic dementia.
6	XVII- 3	60	?	3 weeks.	Dementia. Sluggish pupils. Romberg's sign. Absent knee jerks. Slight slurring speech.	?
7	XVII- 9	35	?	3 days.	Dementia. Scar on corona.	?
8	XVII-11	58	6 months.	4 months.	Dementia. Unequal knee jerks. Unequal pupils. Muscular tremors.	Organic dementia.
9	XVII-21	49	?	2 months.	Simple dementia. Unequal pupils. Tremors of muscles and speech. Facial asymmetry. Exaggerated knee jerks.	Brain tumor.

Remained in bed quiet during the day but moaning and restless at night and growing gradually weaker and died after two months of hospital residence.

Autopsy—head only—37½ hours post mortem. Pia slightly hazy with slight subpial fluid accumulation. Pial adhesions between frontal poles. Pia strips readily without lacerating cortex. No noticeable cortical atrophy. Brain weight, 1,350 gm. Marked fine granular ependymitis in lateral ventricles over anterior end of caudate nuclei. Floor of fourth ventricle shows considerable rugose roughening and slight definite fine granulation in its anterior end. Remains of small area of softening in right caudate nucleus. Basal vessels not remarkable. Spinal cord not removed.

A gross anatomical diagnosis of general paralysis was made on the strength of the pial haziness and granular ependymitis, but the microscopic examination showed no lesions of paresis or other characteristic brain changes and hence it is classed as an undiagnosticated case though probably one of alcoholic deterioration with complicating physical signs, which may have been in part at least the result of the focus of softening.

Case No. 2. Autopsy No. XVI–3. White male, age 26, of American parentage. Paternal grandmother was insane and father alcoholic. Personal history unimportant. Complained of being tired and "all in" for a week, then complained of headache and developed a temperature with marked mental confusion and restlessness. He was admitted to the neurological service of the Boston City Hospital, where he remained a week. At this time the Widal reaction proved negative, leukocyte count 14,000. Lumbar puncture was performed, yielding a clear fluid under slight pressure. No report of further examination of the fluid is made. During his residence talking and restlessness were continuous, being only interrupted during sleep produced by large doses of hypnotics. A provisional diagnosis of dementia præcox was made and the patient committed to the Worcester State Hospital. During his residence at Worcester the talkative restlessness continued until reduced to muttering by weakness. The temperature varied from 98.9° to 101.6°. Physical examination showed diminished knee jerks and a circular preputial scar. Otherwise not remarkable.

Autopsy was performed 14 hours post mortem. The lungs showed considerable edema in the dependent portions. The small intestine showed several areas of ulceration limited to the Peyer's patches with rough necrotic bases and slightly elevated and overhanging edges. Brain weight 1,345 gm. Pia considerably thickened. Considerable excess of subpial fluid. Pial vessels engorged. Slight suggestion of narrowing of convolutions at frontal poles, elsewhere convolutions are of good width and with their margins well approximated. Moderate sprinkling of fine granulations in the lateral ventricles. Moderately liberal collection of fine granulations in the cerebellar angles of the fourth ventricle.

The absence of lesions of general paralysis in the microscopic sections of this case and the presence of ulcers strongly suggestive of typhoid fever (the organism was not recovered in the cultures taken at the time of the autopsy) suggest that the final diagnosis should be that of a toxic delirium probably from typhoid fever.

Case No. 3. Autopsy No. XVI–11. White female, age 33. No personal or family history obtainable. Said to have acted queerly for about a year. On admission there was advanced dementia. Disoriented. Memory very poor. Speech slow, thick and slurring. Physical examination curtailed because of physical condition of patient. Pupils unequal and rigid to light. Knee jerks very lively.

Autopsy 4 hours post mortem. The gross findings in the organs of the trunk were not of interest. Brain weight 1,350 gm. Pia milky and somewhat adherent to convolutions. At the base of the brain were found masses of marked increase of consistence involving both cornua and extending forward on the right into the temporal and orbital gyri, backward on the left along the common calcarine sulcus and downward through both crura into the pons. Microscopical examination of these areas shows advanced lymphocytic infiltration with areas of necrosis. There is not, however, the widespread perivascular exudate characteristic of paresis.

The final diagnosis in this case is that of cerebral syphilis.

CASE No. 4. Autopsy No. XVI–13. White male, age 28. Negative personal and family history. About a year before admission was in bed with a "nervous breakdown." Six weeks before death an attack of insomnia, irritability and emotionalism ushered in a stupor of several hours. This was followed by a period of marked motor excitement with delusions of grandeur and visual hallucinations. During his hospital residence of 10 days he was restless, frequently noisy and talkative especially when alone at night, often mute when interviewed. His production, both voluntary and when questioned, showed stereotypy and mannerism which at times approached a jargon aphasia. Physical examination showed diminished knee jerks, asymmetric innervation of face, scar on corona glandis.

Autopsy 4 hours post mortem revealed a hemorrhagic ileocolitis and bronchopneumonia as causes of death. The brain weighed 1,415 gm. Pia contained a moderate excess of clear serous fluid and was for the most part thin and delicate, though there was some milkiness along the vessel channels and over the vertex. The convolutions were of good width. Very fine granulations were noted in moderate numbers in the lateral ventricles and in profusion in the fourth, especially in the cerebellar recesses.

This case is also placed in the undiagnosticated group, but is probably one of dementia præcox.

CASE No. 5. Autopsy No. XVI–21. White male, age 54. Personal and family histories unobtainable. Arrested by the police for vagrancy and committed to the hospital. Markedly demented. Memory very poor. Disoriented. Slightly expansive. Speech thick, but not definitely slurring. Physical examination: Pupils very sluggish to light, normal to distance. Coarse tremor of tongue and hands on extension. Gait and station unsteady and feeble. Small scar on corona glandis. Later an inequality of the pupils was apparent.

Autopsy 8 hours post mortem showed chronic valvular heart disease and chronic nephritis, both of fairly advanced type. Arteriosclerosis of the cerebral vessels, subdural hemorrhage of considerable volume and a small cortical cerebral hemorrhage in the third left temporal convolution. Brain weight, 1,260 gm. Pia somewhat thickened and lightly adherent everywhere. Floor of the fourth ventricle shows a few very fine granulations.

The cardiorenal and vascular disease with the subdural and cortical hemorrhages place this case in the organic dementia group.

Case No. 6. Autopsy No. XVII–3. White male, age 60. Born in Ireland. Picked up by the police in the Boston Public Garden and committed to the Boston State Hospital. No history obtainable. Marked memory defect and fabrication. Patient himself gives history of steady drinking for years. Transferred to the Worcester State Hospital with a provisional diagnosis of Korsakoff's psychosis. Demented and disoriented for time and place. Somewhat euphoric. Memory very poor, but is productive in fabrication. Slight slurring of words. Gives history of long alcoholism and admits delirium tremens twice. Patient's statements on points which can be controlled are very untrustworthy, however. Physical examination: Copper colored scars on tibial surface of left leg. No tenderness along nerve trunks. Pupils react sluggishly to light, normal to distance. Tremor of tongue and hands. Gait unsteady. Unable to stand in Romberg's position. Knee jerks absent.

Autopsy 5 hours post mortem showed an infarct and edema of the lungs as probable immediate causes of death. Brain weight, 1,290 gm. Pia somewhat milky and contains a marked excess of clear serous fluid. Convolutions of good width, except at frontal poles, where there is some narrowing. Numerous very fine granulations in the floor of both lateral and fourth ventricles.

No final diagnosis is attempted in this case, though it may belong to the alcoholic group. The memory defect and fabrication were not associated with demonstrable neuritis and there is no history to corroborate the patient's statements concerning abuse of alcohol.

Case No. 7. Autopsy No. XVII–9. White male, age 35. Previous personal history and family history unknown. Onset unknown. Advanced dementia. Untidy. Refuses to eat. Restless and muttering. Does not speak and apparently does not hear when spoken to. Death without premonitory symptoms after 3 days' residence.

Autopsy 16 hours post mortem showed double chronic otitis media, slight edema of lungs, preputial scar, abscess of cervical lymph gland. Brain weight, 1,140 gm. Convolutions are of moderately good width, except over the frontal pole, where there is much narrowing. Pia is markedly thickened everywhere, especially over the vessel channels. Fourth ventricular floor shows a sprinkling of fine granulations. Lateral ventricles show a few fine granulations over the head of the caudate nuclei.

This case is another which is placed by the exclusion of paresis in the undiagnosticated group.

CASE No. 8. Autopsy No. XVII–11. White male, age 58. French Canadian. Family and personal history unimportant. Has used alcohol to excess for many years. Six months before death had a "sunstroke" followed by confusion and loss of memory. Became restless, especially at night, with outbreaks of excitement and probably visual hallucinations. On admission was quiet, disoriented for time and place, poor grasp on surroundings. Complained of headache. Memory very poor. Untidy. Physical examination: Pupils unequal, but react promptly to both light and distance. Slight tremor of tongue. Tremor of hands. Deformity of right knee, which results in limping gait. Station unsteady. Knee jerks unequal. Later head was drawn backwards and to the right and a purulent discharge appeared in left ear.

Autopsy 24 hours post mortem showed internal hemorrhagic pachymeningitis of moderate thickness extending over practically the entire upper surface of both hemispheres. There was slight chronic nephritis, vegetative mitral endocarditis and moderate arteriosclerosis, calcareous miliary tubercles of lungs, preputial scar, and chronic suppurative otitis media.

Here again the final diagnosis is organic dementia on an arteriosclerotic basis.

CASE No. 9. Autopsy No. XVII–21. This case has been reported in full by Whitney.[8] White male, age 49. Born in America of Bohemian parents. Family history negative. Patient was educated as a musician and as a young man gave considerable promise, succeeding his father as leader of an orchestra at the age of fourteen. Continued as a professional musician until the age of 34, when he took up the trade of metal painting, still continuing his music, however, as a teacher and in composition and orchestra work. During these 15 years he complained of not "feeling right" and frequently laid off from work for a day or two. One year before death there was a period of six months during which he appeared "logy," dissatisfied, irritable and somewhat depressed and during this period there is recorded a "fainting spell." This condition cleared up for four months and then recurred and a progressive mental and physical deterioration set in. On admission he was markedly demented and slovenly. No hallucinations, no evident delusions. Not expansive or euphoric. Complained of tasting and smelling paint constantly. Physical examination: Pupils equal and react to both light and distance. Facial asymmetry. Tongue protruded toward right with coarse tremor. Marked tremors of all muscles and tremulous speech. Reflexes not abnormal. Three days before death there developed a series of convulsions of tonic and clonic type, largely left-sided. Following these there was noted marked inequality of the pupils, exaggerated knee jerks, double Babinski and double ankle clonus.

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[8] *American Journal of Insanity,* Vol. LXIX, No. 4.

Autopsy 4 hours post mortem showed a large brain tumor in the right frontal lobe with some involvement of the left frontal lobe. The tumor was attached to the falx cerebri and dura, and microscopic examination showed it to be an endothelioma. There was also an advanced bronchopneumonia.

Final diagnosis: Organic dementia from tumor of the brain.

These cases where the diagnostic error was of positive direction naturally fall into two groups. The first group contains those in which gross anatomical or microscopic examination has yielded definite final diagnosis while the second contains those in which the microscopic evidence simply serves to show the absence of lesions of paresis leaving the case undiagnosticated or referring the diagnosis to other clinical possibilities by exclusion. The following table gives these results.

1. Organic brain disease:	
(*a*) Vascular origin	2
(*b*) Brain tumor	1
(*c*) Cerebral syphilis	1
2. Undiagnosticated	2
Undiagnosticated, probably alcoholic	1
Undiagnosticated, probably dementia præcox	1
Undiagnosticated, probably toxic delirium (typhoid)	1

Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

Thirty-ninth Annual Meeting, Held in Washington, May 5, 6 and 7, 1913

The President, Dr. Pearce Bailey, in the Chair

(Continued from page 717)

Dr. Philip Coombs Knapp, Boston, read a paper entitled, "Two Cases of Removal of Extra-Dural Tumor of the Spinal Cord." (To be published in this Journal.)

A PECULIAR AND UNDESCRIBED DISEASE OF THE ROOTS OF THE CAUDA EQUINA

By Charles A. Elsberg, M.D., and Foster Kennedy, M.D.

The speakers said that during the last few years, in a large number of spinal operations, 84 of which were performed by one of the writers, they had met with five cases so alike in their histories, their clinical findings, and in the peculiar swelling and discoloration of the roots of the cauda equina that they had been led to class them together in the belief that they form a definite clinical and pathological entity. Pain was present in the back of the thighs and legs in all of the patients; atrophy of the anterior muscles with loss of the power of dorsal flexion of the foot was present in four; the objective sensory changes consisted of loss in the sacral and lowest lumbar nerves. The disorganization of the functions of the bladder and rectum was complete in four patients. The abdominal reflexes were regularly present, while the ankle jerks were lost in four; the knee jerks became lost coincident with the upward progress of the disease. The conditions found at operation were mainly a swelling and reddish-blue discoloration of many or all of the roots of the cauda equina. A thorough search of the literature failed to reveal any proven cases like those described. A few cases had been reported in which a clinical diagnosis of neuritis of the cauda equina was made and the condition was believed to be syphilitic, but in none of these was the diagnosis verified by operation or autopsy. A very similar disease has been described in the horse, and the post-mortem examination revealed a condition like that found in the patients operated upon and reported in this paper. The Wassermann test both in the blood and cerebrospinal fluid was negative in all of the cases, therefore the condition is not luetic. There were no signs of meningeal lesions.

GIANT TUMORS OF THE CONUS AND CAUDA EQUINA, SYMPTOMS, ANATOMICAL FINDINGS, OPERATIVE RESULTS

By Joseph Collins, M.D., and Charles A. Elsberg, M.D.

The speakers said that the patients began to complain of pain and stiffness in the back, extending down the posterior aspect of one thigh and then of the other thigh. The pain was intermittent at first, later it was continuous. After the expiration of one year or more the symptoms became worse, one or double foot-drop appeared, the lower limbs became weaker and stiffer, and knee and ankle jerks disappeared. Then followed disturbance in the functions of the bladder and rectum, irregular sensory loss, rigidity of the lumbar vertebral column, and tenderness of the lumbar spines. Peroneal palsies were regularly found with electrical changes. The patients were often thought to have tabes, and had usually been treated for long periods for sciatica. The important features of the clinical histories were the following: A history of one or more years' duration, pain in the small of the back sooner or later extending down one and then the other extremity; stiffness of the back in the lumbar region; increasing weakness and stiffness of the lower extremities with loss of power of dorsal flexion of the foot; slight disturbances of the bladder and rectum. The important features of the clinical examinations were the following: Rigidity of the lumbar vertebral column; weakness and stiffness of the lower limbs; paralysis of the peroneal groups of muscles and sometimes of the tibialis anticus group; dropped foot on one or both sides; absence of knee and ankle jerks; tenderness of the lower lumbar spines; irregular and asymmetrical sensory disturbances; lumbar puncture usually negative. The typical findings at operation consisted of a large reddish-brown non-vascular tumor within the dura, filling the entire lower part of the spinal canal, surrounding the roots of the cauda equina and extending upward on the conus with which it was not closely connected. The growth was not intimately connected with the inner surface of the dura, and could be easily freed from it, after which the inner surface of the dura was found to be smooth and glistening. The growths were well encapsulated above, but were closely connected with the nerve roots below. The peculiar features of the cases were: The large size of the tumors; the late appearance of bladder and rectal disturbances; the relatively small amount of sensory loss in spite of the fact that the tumors filled the entire lower part of the spinal canal; and the benign course of the disease without tendency to perforation of the dura. Operative intervention should be done in two stages by the "extrusion" method. If the cases were recognized early, radical removal of the growths should be possible.

The above three papers were discussed jointly.

Dr. Archibald Church, Chicago, said that he was reminded by Dr. Knapp's paper of an experience of comparatively recent date, which, while it may not be edifying, is interesting, namely, three tumors followed by three successful operations in the same patient. The first tumor presented symptoms four years ago. At the end of a year the patient, a woman, was entirely paraplegic, the disturbed sensory zone extended from the second rib downward. There were increased reflexes, Babinski, etc., incontinence from bladder and bowels. Dr. Patrick saw the case in consultation. Dr. Murphy operated. The tumor was found in the cervical region on the right side of the cord and was called an endothelioma. She made an uneventful recovery and in the course of six months recovered her motor and sensory functions completely. An interesting feature which Dr. Church had seen repeated in other cases and to which the books and monographs on the subject do not call sufficient attention, is the gradual downward improvement of sensation, so that at the end of three weeks she detected all kinds of stimuli at the level of the umbilicus and later in the extremities. At the end of two years she began to have the same symptoms of spinal tumor and within six months had developed a similar paraplegia. A second operation found another growth in connection with the pia about an inch lower than the first tumor but in front of the cord. Whether or not this was a recurrence of the first growth Dr. Church did not know. It was supposed to be essentially an independent neoplasm. For nine months she had comparative freedom. Two weeks ago she came back to Chicago for a recurrence, the sensory level now being at the level of the third rib. Early last week a third operation was done and a third tumor on the left of the cord was removed. Dr. Church said he had two cases of extensive cauda equina growths. Some eight years ago a surgical friend had treated with castor oil and subsequently with osmic acid injections a case of supposed double sciatica. When Dr. Church saw the man he had the typical manifestations of a caudal lesion. This endotheliomatous growth filled the entire neural cavity of the sacrum and lower lumbar region and was so intimately related to the cauda that no attempt was made to remove it. The man perished from kidney trouble. About three years ago Dr. Church saw a young boy with terrible pains in the legs, who was treated for hysteria, and after many months of suffering, finally and almost accidentally was found to have a little area of sensory loss corresponding to the caudal outline, and upon this comparatively slight symptom, although the bladder was not materially affected, an operation was done and an infiltrating endotheliomatous neoplasm extending from the middle of the lumbar spine to the lower end of the sacral canal was uncovered. It was not considered feasible to remove it and safest to let the case take its course. Dr. Church saw the boy again nearly two years later. The operation wound had healed and remained perfectly solid. His cord symptoms had not increased, but a tremendous growth had invaded the abdomen. Apparently pressure had been relieved from the caudal region so that it had inhibited further neural symptoms and the growth had extended in the anterior direction. These large caudal tumors may be more frequent than we now suppose.

Dr. William M. Leszynsky, of New York, said that in listening to the report of Dr. Elsberg in regard to disease of the roots of the cauda equina, it occurred to him that the injection of normal saline solution into the lumbosacral canal, as practiced in cases of sciatica, might prove a valuable therapeutic measure before resorting to laminectomy. In this way we might cause an absorption of any inflammatory exudate, or favorably influence the local circulation. One of the patients with tumor of the cauda equina was sent to Dr. Elsberg by Dr. Leszynsky for operation. She was a woman fifty years of age, who had bilateral sciatic pain for many years. The diagnosis had not been made until she came under Dr. Leszynsky's observation. At that time she was almost completely paraplegic, and bladder incontinence was present. Lumbar puncture proved ineffectual in obtaining any cerebrospinal fluid, although he punctured at various levels many times. He thought that the mere fact that one cannot obtain any cerebrospiral fluid should lead one to make the differential diagnosis between tumor and neuritis of the cauda equina. In the case of the patient just mentioned, the tumor mass filled the lower portion of the spinal canal. Soon after the operation the area of analgesia increased and rapidly extended almost up to the third or fourth rib and a large trophic bed sore developed over the buttocks. For a long time it seemed almost impossible to obtain union of the wound. The patient continued under Dr. Leszynsky's observation, remaining paraplegic, and died several months later. At the autopsy the spinal canal was found refilled with the gliomatous mass which reached up to the conus. There was degeneration of the sensory tracts up to the cervical region, with areas of gliosis and cavities in the posterior columns.

Dr. William G. Spiller, Philadelphia, said that neuritis confined to the roots of the lower part of the cord is an exceedingly important condition. French neurologists especially have for a number of years devoted much attention to root nueritis, and syphilis has been found to play an important rôle in etiology. The microscopical study of the material in the cases reported by Drs. Elsberg and Kennedy would be of great interest. One would expect to find a meningitis, even though meningitis were not evident to the naked eye. The differential diagnosis between root neuritis of the cauda equina and tumor of this part is very difficult, and yet it is one of great practical importance.

Dr. Spiller said in his experience the tumors in the lower part of the spinal canal are likely to be infiltrating and malignant, more so than those in the upper part of the canal, where the well defined endothelioma or fibroma is not a rare finding. Statistics of cases of spinal tumor therefore should take into account the situation of the tumor. Relief of pain by cutting the anterolateral column high in the cord could be obtained where the tumor of the cauda equina is not removable, as in the case reported by Dr. Martin and himself.

Dr. Philip Coombs Knapp, Boston, thought that Dr. Church's case was of particular interest because not long ago Oppenheim, in his own series of cases, remarked that the return of symptoms or recurrence of the growth in spinal cord tumors was something he had not experienced.

Dr. Joseph Collins, New York, said it seemed to him there were two or three points which might very well be emphasized. In the first place it was the apparent uselessness as far as the patient's restoration to a degree of health and usefulness is concerned in operating on these caudal tumors as they are now being operated upon, his experience being that it does not give any considerable degree of life and does not restore the patients to any degree of health. In the three cases of their paper, the first patient lived a short time only, the second patient lived about three and a half years, and the third patient is now in a condition more deplorable even than before the operation. The significance of that fact was that, the clinical picture being so clearly cut, we must diagnosticate these cases earlier than we do now. In the second place the differential diagnosis between these tumors and the symptom complex which Drs. Elsberg and Kennedy referred to could not be made, Dr. Collins thought, at the present time, and he was sure that if we relied on the condition of the cerebrospinal fluid in a case that had the symptoms of caudal tumor in making the differential diagnosis we should go wrong very frequently. Dr. Collins thought that Dr. Elsberg was in error in one thing in reporting on those cases of caudal neuritis, in which he said the cerebrospinal fluid was always negative. In one in which it was not negative the cerebrospinal fluid withdrawn had the most extraordinary appearance. It was a very pale reddish-brown color. It had no cellular constituents such as we have been led to believe is more or less suggestive of spinal disease. It did not reduce Fehling's solution. That may be of considerable importance when you come to interpret this case in Dr. Elsberg and Dr. Kennedy's paper. The case has been recorded by Dr. Collins in the *Medical Record.* The patient was a clergyman who had been seen two or three days before Dr. Collins saw him by an orthopedic surgeon in Boston, who maintained and still maintains that he had osteoarthritis, and he had been seen in New York by an orthopedist, who advised a plaster cast. He had two considerable falls, one while Alpine climbing and another in stepping off a tram in London. In discussing this operation he suggested that it was quite possible that one or both of these injuries had produced a hematorrhachis and the discoloration of the cerebrospinal fluid may have been the result of the change it underwent after the escape of blood from the vessels. In the second place, the patient had an extraordinary somatic condition of great interest as pointing to the possibility that this caudal neuritis is a condition dependent upon structural changes, metabolic changes throughout the entire economy. About the year before he developed his symptoms of caudal neuritis he suddenly apparently developed double arcus senilis. Polygraphic tracings of his pulse and veins showed decided abnormality. Dr. Collins thought that these two conditions had a significant bearing on the causation of the condition. Finally, a word about operation in these cases. In the two cases that have occurred in Dr. Collins' service and upon which Dr. Elsberg had operated, recovery has practically occurred in the first; in the second case, the clergyman who was operated on in February, recovery from cystitis has occurred. Aside from the overwhelming depression he has he is in a satisfactory condition. He has gained 15 pounds in weight and is able to move about on crutches. Now as to why these patients were not treated with antisyphilitic medication. The reason was that it was not Dr. Collins' custom to treat patients who had no clinical evidence of syphilitic disease and who had no suspicion from chemical evidence, from evidence of the cerebrospinal fluid, with mercury or with salvarsan. He would no more think of giving mercury or salvarsan to patients who do not display clinical evidences of syphilis or to patients who had negative serum and cerebrospinal fluid tests than he would of treating a case of chronic contracted kidney with salvarsan.

Dr. Sidney Kuh and Dr. Morris Braude, Chicago, read a paper entitled "A Contribution to the Pathology of Myasthenia Gravis." (See this Journal, p. 617.)

Dr. E. E. Southard, Boston, inquired whether cultures were made in this case. He had some experience with pneumococcus and streptococcus cases of myelitis and encephalitis in which thrombi were found of a somewhat characteristic sort. These thrombi showed polynuclear leukocytes in most cases under the endothelium, which was often itself reduced to a slender strand of tissue in the middle of the vessel. In some cases he has found them not only in the bulb, but higher up in the basal ganglia. They have had a brief duration, and Dr. Southard has the idea that the polynucleosis found by Drs. Kuh and Braude indicates a rather terminal affection and should hardly have supposed that it would be possible to ascribe to these thrombi such a condition as myasthenia gravis. Was there any evidence of the effect of these thrombi on the tissues surrounding them? Also, were there changes in the cerebellum which would indicate that the asthenia was in part due to any effect upon the cerebello-rubral system?

Dr. Southard said his questions related to the acuteness of these findings, whether they could be related to such a chronic condition as myasthenia.

Dr. Kuh, in closing, said that it was unfortunately impossible for him, perhaps fortunately for his hearers, to read the paper in full. The character of the thrombi was positively not that described by Dr. Southard. The endothelium was distinctly seen. It was a case of true thrombosis which could be followed over a considerable area. Cultures were not made. The material, aside from the central nervous system, was turned over to a pathologist who agreed to make a very careful and painstaking examination and who simply wasted the material and from whom Dr. Kuh had not been able to get any report at all. There was no rise in temperature. So that anything like pneumococcus infection would seem improbable for that reason. There were no cerebellar changes. It was his belief and he states this in the paper, that these thrombi are, of course, secondary. We can't for a moment believe that they are primary. The only expectation he had of having contributed anything at all to the knowledge of the pathogenesis of the disease is that this work may furnish the stimulus for further investigation into the cause of the thrombi and thereby possibly into the primary cause of the disease.

Dr. Southard asked how long Dr. Kuh supposed the thrombi existed.

Dr. Kuh replied that he did not know. In the region in which the thrombi were numerous they found changes in the nerve cells which were not of very recent origin and he did not think it plausible that those two things should occur grouped in that way, most frequent in the very region of the central nervous system in which one would expect changes. That all that should be a mere accident and that there should be nothing else back of it he could not believe.

BILATERAL OCULOMOTORIUS PALSY FROM SOFTENING IN EACH OCULOMOTORIUS NUCLEUS

By William G. Spiller, M.D.

The case was one in which bilateral oculomotorius palsy developed in an apoplectic attack. It was syphilitic in origin and implicated every muscle supplied by the oculomotorius in each eye. Bilateral softening as two separate lesions was found confined to the oculomotorius nuclei. No other cranial nerves than the opticus were affected and the only preceding symptoms were mental disturbance, convulsions and some change in the patellar reflexes. Dorsal extension of each big toe in the Babinski reflex followed the attack, but there was no paralysis of the limbs.

The author has found only one similar case with necropsy in the literature, and in this the oculomotorius palsy was unilateral. The symptom complex is a striking one, and consists of sudden onset of persisting oculomotorius palsy with loss of consciousness, rigidity of the limbs, and stertorous breathing lasting a day or two; the cause is thrombosis of the small blood vessels supplying the oculomotorius nuclei. The symptom complex forms one of a group of conditions depending on vascular occlusion of which the author has studied and described several varieties, some of these being new complexes: as occlusion of the posterior inferior cerebellar artery, occlusion of the uppermost portion of the anterior spinal and adjoining portion of the vertebral arteries, occlusion of the cervical anterior median spinal artery, and bilateral occlusion of the vessels supplying the inner segment of each lenticular nucleus and resulting from carbon monoxide poisoning.

This paper is a contribution to van Gehuchten's Festschrift.

THE PERIMETRIC DEVIATIONS ACCOMPANYING PITUITARY LESIONS

(Preliminary Note)

By Harvey Cushing, M.D., Boston

In a series of 104 examples of pituitary disease, the greater number accompanied by manifestations of tumor, due either to an enlargement of the hypophysis itself or to a superimposed lesion, changes in the fields of vision have been present in a large proportion of the cases.

Few physicians at the present time venture to make a diagnosis of an hypophysial lesion in the absence of a bitemporal hemianopsia; and it has been our experience that the majority of the neurologists and ophthalmologists through whose hands these patients have passed, have hesitated to make such a diagnosis—although there were obvious deviations from the normal in the perimetric outlines—for the reason that these deviations did not show the characteristic bitemporal defect with a more or less definitely vertical meridian separating blind from seeing fields.

As a matter of fact, in a considerable number of these cases the field defect has been an homonymous one; for when the enlarging gland bursts through its dural capsule it may extend into the interpeduncular space to one side of the chiasm rather than in a median posterior position.

The opportunity has been given in this series of cases, not only in many instances to follow the progressive changes in the visual fields as the defect advances, but also to follow the steps by which the normal peripheries become restored after a transphenoidal operation when partial removal of the growth has afforded relief from pressure.

These experiences have shown that in the majority of instances the defect advances in very characteristic fashion, usually beginning in the upper and outer temporal field and affecting color vision before vision for form. These minor changes are as characteristic of a retrochiasmal lesion as is the full-blown text-book picture of complete bitemporal hemianopsia. Furthermore the defect rarely advances with equal steps in the two eyes, and consequently for each individual eye it proves to be a matter of clinical convenience to divide the advancing process into stages, as follows:

Stage I shows merely a notch, often quadrantal, in the upper temporal field for color, though there may be in addition some slanting off of the form field. This is due to the fact that the ventral crossed fasciculus is affected by the pressure at an earlier stage than is the dorsal crossed fasciculus, the transmission of color impulses suffering earlier than the transmission of form impulses.

Stage II. In this stage a beginning quadrantal constriction in the form field follows upon the quadrantal defect for colors.

Stage III. Here color vision is more or less completely lost in the entire temporal field, the form constriction remaining practically quadrantal, with beginning encroachment upon the lower temporal field.

Stage IV. In this stage hemianopsia is complete for form and colors, the macula still being spared by the otherwise practically vertical meridian.

Stage V. Hemianopsia remains complete for form and color, the macula now being included in the vertical meridian, there being in this stage often an actual complete macular blindness for colors.

Stage VI. Macular vision is lost for form as well as colors and the nasal field begins to shrink from the vertical meridian.

Stage VII. Color vision is entirely lost but a patch of vision for large objects remains, usually in the lower nasal quadrant.

Stage VIII. Blindness.

The least affected eye progresses in the meantime along the same route; for it cannot be emphasized too strongly that the process rarely advances with equal step in the two eyes. Indeed, commonly enough one eye may be completely blind, whereas the other may show a condition in Stage I, or may be with no observable change whatever.

Even after *Stage VIII* with blindness has been reached some vision may be regained by operative measures; which goes to show that the disturbance is brought about not only by an anatomical destruction of the fibers through a process of degeneration, but also by a physiological block to the transmission of impulses superimposed on the actual atrophic changes.

Though the prospect of a return of vision therefore is not utterly hopeless, even when blindness has supervened, it is nevertheless of great importance for us to recognize these evidences of chiasmal pressure in their early stages.

Pituitary disease, as must be emphasized, is a common malady, heretofore largely overlooked. One serious complication of the disorder is a socalled primary optic atrophy; and this is in many respects the most obvious of the neighborhood symptoms and one for which surgical measures are as definitely indicated as when dyspnea is produced by pressure against the trachea in cases of goitrous enlargement of the thyroid gland.

LESIONS OF THE HYPOPHYSIS AND OF THE UNCINATE REGION, WITH THE RECORDS, CLINICAL AND PATHOLOGICAL, OF A SERIES OF CASES

By Charles K. Mills, M.D., and Williams B. Cadwalader, M.D.

The paper was based on a series of eight cases, two of which had been previously shown at another society, both before operation. Of the eight cases one had presented uncinate without pituitary symptoms, necropsy in that case showing a large tumor involving the uncinate convolution, but extending into other regions of the cortex and subcortex. Of the other seven cases three presented both pituitary and uncinate phenomena of a decided character. In the other four uncinate symptoms were absent, pituitary phenomena being pronounced. These phenomena, however, were of a mixed character, illustrating dyspituitarism rather than either hypo- or hyperpituitarism. In one of the cases with decided uncinate symptoms no lesion of the temporal lobe was discoverable. In one case, in which the patient died after operation, a necropsy showed a tumor involving the infundibulum, pineal gland and adjoining structures. In three of the operated cases pathological conditions of the hypophysis were found at the operation and confirmed by microscopical examination of parts of the tissue removed. The authors are favorable to the fronto-orbital operation of Dr. Frazier for the exposure of the hypophysis. They believe it has distinct advantages over that of approach by the nasal route. Only operation, however, gave successful results in a limited number of cases. The authors discussed the manner of the production of the conjoint pituitary-uncinate symptom complex.

The two papers above were discussed jointly.

Dr. Alfred Reginald Allen said concerning the material to which Dr. Mills referred, Dr. Frazier had a full microscopical report of the findings of the four cases. He thought Dr. Mills referred to an interesting scraping from the anterior lobe of the pituitary body. It was put at the operating table into Zenker's fluid and showed most beautifully karyokinetic figures in the parenchymatous cells of the anterior lobe, but nothing that would make him consider it a pathological growth. It appeared as if some irritation there had whipped up the multiplication of normal cells.

Dr. J. Ramsay Hunt, New York, enquired of Dr. Cushing whether any cases of sudden transitory blindness had come under his observation, in which acute amblyopia might have been an effect of hypophyseal disease. Quite recently Dr. Hunt had seen a case, in consultation with Dr. Kinnicutt, with definite clinical symptoms of dyspituitarism in which blindness had come on quite suddenly, while working in an engine room. The sella turcica was not enlarged and the fields of vision were perfectly normal before the onset of the blindness. The man had been taking for three weeks an extract of the posterior lobe. As no other condition could be found which might have caused such an ocular manifestation, it was thought that there might have been some connection with the hypophysis. The clinical symptoms were unmistakably those of a mixed lesion of the pituitary.

Dr. Cushing said in reply to Dr. Hunt's query that he had seen many examples of scotomata, particularly of relative scotomata. These as de Schweinitz pointed out a few years ago, are most apt to occur in the upper, outer quadrants. He made no mention of these defects, however, in this preliminary note, for he did not wish to confuse the question by going into too great detail. Dr. Cushing believes that the scotomata are presumably due to the fact that there are fluctuations in the pressure symptoms with swelling and recession of the glandular enlargement, which at one time presses against the chiasm, causing the slight defect described in *Stages I* and *II* and leading to some slight damage, which is very largely recovered from, when a subsequent temporary recession of the swelling occurs, leaving the relative scotoma near the central part of the field.

It may be noted that in pregnancy the pituitary body occasionally enlarges sufficiently to produce a transient tendency to one of these minor bitemporal defects.

Periods of socalled temporary amaurosis are much more apt to occur in patients in whom there is an advanced secondary optic atrophy associated with a tumor which has produced a choked disc. However, even in these cases of socalled primary atrophy there may be more or less fluctuation of the symptoms, even when the condition has gone on to an advanced stage of the process.

In reply to Dr. Mills's question Dr. Cushing stated that he had made an extensive comment in his monograph, put together two years ago, on the uncinate seizures which characterize these cases. He was unable to recall the exact figures, but thought that possibly ten per cent. of the cases had given a history of more or less characteristic dreamy states, or actual fits, with a gustatory or olfactory aura. This means, of course, that the growth, as in the case cited by Dr. Mills, had actually burst through the dural capsule of the gland and extended up into the interpeduncular region, as illustrated by some of the photographs shown in connection with the presentation of the paper.

Dr. Cushing stated further that he had purposely avoided saying anything in particular about the operative procedure which he has chosen to follow. It is largely a question of one's familiarity with the method which he has most often practised; but Dr. Cushing said that he thought in the majority of the conditions the operation resolved itself into one of two comparatively simple measures—either a transphenoidal operation by the submucous method of approach, which he has described, with removal of the sellar floor and more or less evacuation of the sellar contents, provided the sella turcica has been greatly distended; or, on the other hand, a simple subtemporal decompression in case the growth has evidently burst through the pituitary fossa, or actually started as a suprasellar lesion. As a rule the duration of the patient's hospital residence subsequent to one of these operations is comparatively short—usually from seven to fourteen days.

In Dr. Cushing's series of 104 patients there have been 75 surgically treated cases. Forty-six of these 75 patients have had a transphenoidal operation, 6 of them a second operation, and 3 a third operation. Twenty-two patients have had a simple subtemporal decompression, and 7 have had a transphenoidal operation with subsequent subjection to a subtemporal decompression. There consequently have been 93 operations, and out of this number there have been 9 fatalities—about 10 per cent.—most of them early in the series and in patients with a lesion too far advanced to justify intervention—conditions which are sufficiently well understood at present so that such futile surgical measures would not be undertaken to-day.

The young man to whom Dr. Mills referred at great length had glandular symptoms antedating his period of puberty, and he is now some 38 years of age. A simple transphenoidal operation at a time before his uncinate seizures began would in all likelihood have prevented the invasion of the cranial chamber by the slowly enlarging struma.

Dr. Cushing said, furthermore, that he believed the approach to the gland first advocated by Hartly and subsequently by Krause, and to which attention has again been called by Frazier, is not only a measure which would fail to disclose the lesion in the more favorable surgical cases—namely those in which the growth actually occupies the enlarged sella turcica—but that it could hardly be of permanent benefit either to the cases in which there is an interpeduncular cystic congenital tumor or in those in which a glandular struma has actually burst from the capsule and invaded the cranial chamber; and that though in Dr. Frazier's skillful hands it is a measure which might be justifiable, it is unquestionably one which few would venture to seriously advocate for the general run of these cases.

HUNTINGTON'S CHOREA: A STUDY IN HEREDITY

By Smith Ely Jelliffe, M.D., Elizabeth B. Muncey, M.D., and C. B. Davenport, M.D.

Some ten to twelve years ago Dr. Jelliffe began to collect data relative to the hereditary history of Huntington's chorea in the United States.

In 1908 in the special Huntington number of Dr. Browning's Neurographs he made a preliminary report upon the material collected to that time. This material was restricted to the socalled early families.

In the preliminary paper under discussion he referred to Sinkler's and King's suggestion that many of the early reported cases were of closely related ancestry and that if the complete ancestral history could be obtained all of the cases might be traced back to a restricted focus or series of foci. He was enabled at that time to show that this was partly so and was able to gather, from the early literature and the material then in his possession, enough evidence to make three or four provisional groups, which were called the Long Island, Bedford and Wyoming groups, as reported by Huntington, Waters, Lyon and Gorman respectively. A Massachusetts group was also suggested. It also seemed possible to assert that Huntington's chorea showed Mendelian dominance in heredity.

Shortly thereafter Dr. Jelliffe was fortunate enough to obtain the interest and coöperation of Dr. C. B. Davenport and an extended hereditary survey was planned. The material was turned over to him and for the past three or four years Dr. Elizabeth Muncey has made a most painstaking research in the field. She has personally visited the localities, interviewed living members of the afflicted families, seen thousands of the individual descendants.

As a consequence they are enabled to report in a purely preliminary way some of the results of this extensive survey, the most extensive of any one disorder that has ever been brought together.

The original groups have been broken up into the representative families and it has developed that the early American material, roughly speaking, has come from about five separate sources. These have received extended study and approximately 9,000 individuals have come under consideration. In this collection there are about 1,000 cases of Huntington's chorea. Only one of these families is represented in the chart presented with 260 individuals with Huntington's chorea.

The analysis of this material has only just begun, and it is impossible to assert just what is going to come out of it. Not only is this material available in this charted form, but a complete record of all of the individuals has been recorded from the standpoint of neurological and psychiatric heredity.

Dr. Davenport said their studies have, in general, confirmed the statement repeatedly made that Huntington's chorea is a trait that does not skip a generation. If any individual is free from the tendency to the disease that individual, if mated with an equally immune person, cannot become the progenitor of offspring with the disease—once the line of descent is free it is always free.

The modern interpretation of this state of affairs is that Huntington's chorea is due to the presence in the germ cell of a determiner that persons who do not belong to the affected strain lack. If the fertilized egg (or zygote) receives this determiner from either side of the house, then in the person who develops from that zygote the trait will develop and, moreover, in half of the germ cells of that person the determiner for Huntington's chorea will occur again. If in any person Huntington's chorea does not develop then that is *prima facie* evidence that that person does not have the determiner for the trait anywhere in his makeup—he does not have it in his germ cells and, hence, cannot transmit it.

The practical application of this rule to eugenics is much diminished in value by the circumstance that the onset of chorea is often late in life, usually long after the period when mates are selected. As only half of the members of a fraternity are typically affected, each member feels that he may escape and, if he considers the matter at all, runs the chances. It may be that future studies will show a difference in the behavior, even at puberty or shortly after, of those who carry the determiner for chorea and those who do not,—a difference pronounced enough to enable the expert to judge which of a fraternity will probably succumb and which are immune. Such a means of differential diagnosis would be of great eugenical importance and deserves to be diligently sought after. In many cases a marked irritability or lack of control begins to show itself months and even years before the forced movements are noticed. We should look for the germs of such behavior even at puberty.

A careful consideration of the charts reveals certain exceptions to the rule that a generation is not skipped. In the case of a disease whose onset is relatively late in life it is to be expected that the parents shall often die before the age at which the disease is due to develop in them. Certain other cases are due to ignorance of the facts,—to false statements made with the desire to shield parents or close relatives. We are warned, by a very few instances, that illegitimacy may possibly confuse the result. But, after all cases of these kinds have been eliminated, there remains a residuum that can, it seems to them, only be accounted for by the occasional failure of the determiner to develop in the parent of an affected child. Students of breeding recognize the occasional *failure of dominance* as a thing to be considered, a thing yet unexplained, but a fact that does not militate greatly against the general acceptance of the nearly universal law of heredity as set forth.

Every student of heredity is on the lookout for evidences that traits as we know them are composite in their hereditary elements. A rapid survey of the data indicates, first, that the symptoms of chorea are not precisely the same in all family strains. Thus one branch is characterized by the fact that the choreic movements begin in the head; in another in the hands. In one family (Flushing, VIII, 261, 263) one choreic brother has a daughter between 60 and 70 years old who is beginning to show twitchings of the hand at this advanced age. Another choreic brother was first attacked at 60 in his hands; the forced movements have since become general. The mental decay has been rapid. His eldest son was neurotic; another, attacked at 43, has declined mentally, though the movements are not marked. In another son the onset was at 40; began in the hands and the mind is greatly affected.

In another fraternity (8: 286–295) the age of onset is usually about 30 years (much younger than the last); and in their children the same age of onset is the commonest. This branch also deteriorates mentally very profoundly. One of the cousins had Sydenham's chorea and the daughter of another is similarly affected at present.

In another case (7: 131) the choreic mother lived to be 80 years old, which is itself evidence that the symptoms were not very severe. Both of her children that survived had chorea in a very *light* form. This illustrates family differences in the virulence of the disease.

In another branch (7: 168) chorea is associated with various psychopathic types. The choreic father developed at 40 years the motor and mental symptoms coincidently. He soon developed a chronic psychosis. Of his nine children two died early, two were choreic, two feebleminded and one epileptic. One of the choreic sons had four children, of whom only one grew up and she had a psychosis and has four descendants, all peculiar and neurotic. The epileptic son of the original sire died at 42 years before chorea had shown itself. He had, of three known children, two who were choreic and one who had a psychosis.

The foregoing fragments illustrate not only the diversity of symptoms in different branches of the family but also show the occurrence of Sydenham's chorea without deterioration; the occurrence of mental deterioration without forced movements; and the great range of variation in the age of incidence which ranges, indeed, from birth to sixty years or older. Now advanced age of onset, forced movements, and mental deterioration are three principal diagnostic characters of the disease and since they prove themselves to be independently inheritable the query is raised, which it is hoped that further inquirers may answer, whether Huntington's chorea may be—not a necessary but only a frequent and, to a certain degree, accidental association of the diagnostic traits.

(*To be continued*)

Translations

MYTH OF THE BIRTH OF THE HERO

By Otto Rank, M.D.,

OF VIENNA

Translated by Drs. F. Robbins and Smith Ely Jelliffe

(Continued from p. 722)

Besides this chronological reversal, the reversal of the contents requires special explanation. The first reason for the representation of the birth by its opposite,—the life threatening exposure in the water, is the accentuation of the parental hostility towards the future hero.[76] The creative influence of this tendency to represent the parents as the first and most powerful opponents of the hero will be appreciated, when it is kept in mind that the entire family-romance in general owes its origin to the feeling of being neglected, namely the assumed hostility of the parents. In the myth, this hostility goes so far that the parents refuse to let the child be born, which is precisely the reason of the hero's lament, moreover, the myth plainly reveals the desire to enforce his materialization even against the will of the parents. The vital peril which is thus concealed in the representation of birth through exposure, actually exists in the process of birth itself. The overcoming of all these obstacles also expresses the idea that the future hero has actually overcome the greatest difficulties by virtue of his birth, for he has victoriously thwarted all attempts to prevent it.[72] Or another interpretation may be admitted, according to which the youthful hero, foreseeing his destiny to taste more than his share

[71] According to a pointed remark of Jung's, this reversal in its further mythical sublimation permits the approximation of the hero's life to the solar cycle ("Wandlungen und Symbole der Libido," II Part, *Jahr. f. Psychoanalyse,* V, 1912, p. 253).

[72] The second item of the schedule here enters into consideration: the voluntary continence or prolonged separation of the parents, which naturally induces the miraculous conception and virgin birth of the mother. The abortion phantasies, which are especially distinct in the Zoroaster legend, also belong under this heading.

of the bitterness of life, deplores in pessimistic mood the inimical act which has called him to earth. He accuses the parents, as it were, for having exposed him to the struggle of life, for having allowed him to be born.[78] The refusal to let the son be born, which belongs especially to the father, is frequently concealed by the contrast motive, the wish for a child (as in Œdipus, Perseus and others), while the hostile attitude towards the future successor on the throne and in the kingdom is projected to the outside, namely it is attributed to an oracular verdict, which is thereby revealed as the substitute of the ominous dream, or better, as the equivalent of its interpretation.

From another point of view, however, the family romance shows that the phantasies of the child, although apparently estranging the parents, have nought else to say concerning them besides their confirmation as the real parents. The exposure myth, translated with the assistance of symbolism, likewise contains nothing but the assurance: this is my mother, who has borne at the command of the father. But on account of the tendency of the myth, and the resulting transference of the hostile attitude, from the child to the parents, this assurance of the real parentage can only be expressed as the repudiation as such parentage.

On closer inspection, it is noteworthy in the first place that the hostile attitude of the hero towards his parents concerns especially the father. Usually, as in the myth of Œdipus, Paris, and others, the royal father received a prophecy of some disaster, threatening him through the expected son; then it is the father who causes the exposure of the boy and who pursues and menaces him in all sorts of ways after his unlooked-for rescue, but finally succumbs to his son, according to the prophecy. In order to understand this trait, which at first may appear somewhat startling, it is not necessary to explore the heavens for some process into which this trait might be laboriously fitted. Looking with open eyes and unprejudiced minds at the relations between parents and children, or between brothers' relations such as these exist in reality[74]—a certain tension is frequently, if not regularly revealed between father and son, or still more distinctly a competition between brothers; although this tension may not be obvious and permanent, it is lurking in the sphere of the unconscious, as it were, with periodical eruptions. Erotic factors are especially apt to be involved, and as a rule the deepest, generally unconscious root of the dislike of the son for the father, or of two brothers for each other, is referable to the competition for the tender devotion and love of the mother. The Œdipus myth shows plainly, only in grosser dimensions, the accuracy of this interpretation, for the parricide is here followed by the incest with the mother. This erotic relation with the mother, which predominates in other mythic cycles, is relegated to the background in the myths of the birth of the hero,[75] while the opposition against the father is stronger.

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[78] The comparison of birth with a shipwreck, by the Roman poet Lucretius, seems to be in perfect harmony with this symbolism: "Behold the infant: Like a shipwrecked sailor, cast ashore by the fury of the billows, the poor child lies naked on the ground, bereft of all means for existence, after Nature has dragged him in pain from the mother's womb. With plaintive wailing he filleth the place of his birth, and he is right, for many evils await him in life" (Lucretius, "De Nature Rerum," V, 222–227). Similarly, the first version of Schiller's "Robbers," in speaking of Nature, says: "She endowed us with the spirit of invention, when she exposed us naked and helpless on the shore of the great Ocean, the World. Let him swim who may, and let the clumsy perish!"

The fact that this infantile rebellion against the father is apparently provoked in the birth myths by the hostile behavior of the father is due to a reversal of the relation, known as projection, which is brought about by very peculiar characteristics of the myth forming psychic activity. The projection mechanism, which also bore its part in the re-interpretation of the birth act, as well as certain other characteristics of myth formation, to be discussed presently,—necessitates the uniform characteristic of the myth as a *paranoid* structure, in view of its resemblance to peculiar processes in the mechanism of certain psychic disturbances. Intimately connected with the paranoid character is the property of separating or dissociating what is fused in the imagination. This process, as illustrated by the two parents couples. provides the foundation for the myth formation, and together with the projection mechanism supplies the key to the understanding of an entire series of otherwise inexplicable configurations of the myth. As the motor power for this projection of the hero's hostile attitude on to the father stands revealed the wish for its justification, arising from the troublesome realization of these feelings against the father. The displacement process which begins with the projection of the troublesome sensation is still further continued, however, and with the assistance of the mechanism of separation or dissociation, it has found a different expression of its gradual progress in very characteristic forms of the hero myth. In the original psychologic setting, the father is still identical with the king, the tyrannical persecutor. The first attenuation of this relation is manifested in those myths in which the separation of the tyrannical persecutor from the real father is already attempted, but not yet entirely accomplished, the former being still related to the hero, usually as his grandfather, for example in the Kyros-myth with all its versions, and in the majority of all hero myths in general. In the separation of the father's part from that of the king, this type signifies the first return step of the descent fantasy toward the actual conditions, and accordingly the hero's father appears in this type mostly as a lowly man: See Kyros, Gilgamos and others. The hero thus arrives again at an approach toward his parents, the establishment of a certain kinship, which finds its expression in the fact that not only the hero himself, but also his father and his mother represent objects of the tyrant's persecution. The hero in this way acquires a more intimate connection with the mother (they are often exposed together: Perseus, Telephos, Feridun), who is nearer to him on account of the erotic relation; while the renouncement of his hatred against the father here attains the expression of its most forcible reaction,[76] for the hero henceforth appears, as in the Hamlet saga, not as the persecutor of his father (or grandfather, respectively) but as the avenger of the persecuted father. This involves a deeper relation of the Hamlet saga with the Iranese story of Kaikhosrav, where the hero likewise appears as the avenger of his murdered father (compare Feridun and others).

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[74] Compare the representation of this relation and its psychic consequences, in Freud's "Traumdeutung," p. 172 et seq.

[75] Some myths convey the impression as if the love relation with the mother had been removed, as being too objectionable to the consciousness of certain periods or peoples. Traces of this suppression are still evident in a comparison of different myths or different versions of the same myth. For example, in the version of Herodotus, Kyros is a son of the daughter of Astyages, but according to the report of Ktesias, he makes the daughter of Astyages, whom he conquers, his wife, and kills her husband, who in the rendering of Herodotus is his father. Compare Husing, "Contributions to the Kyros Legend," XI. Also a comparison of the saga of Darab, with the very similar legend of St. Gregory, serves to show that in the Darab story the incest with the mother is simply omitted, which otherwise precedes the recognition of the son; here, on the contrary, the recognition prevents the incest. This attenuation may be studied in the nascent state, as it were, in the myth of Telephos, where the hero is married to his mother, but recognizes her before the consummation of the incest. The fairy-tale-like setting of the Tristan legend, which makes Isolde draw the little Tristan from the water (*i. e.*, give him birth), thereby suggests the fundamental incest theme, which is likewise manifested in the adultery with the wife of the uncle.

The reader is referred to Rank's paper, "Das Inzest Motiv in Dichtung und Sage" ("The incest motive in fiction and legend"), in which the incest theme, which is here merely mentioned, is discussed in detail, picking up the many threads which lead to this theme, but which have been dropped at the present time.

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[76] The mechanism of this defense is discussed in Freud's "Hamlet Analysis" ("Traumdeutung," p. 183, annotation); also by Jones, *Am. Jl. of Psychology*, 1911.

The person of the grandfather himself, who in certain sagas appears replaced by other relatives (the uncle, in the Hamlet saga), also possesses a deeper meaning. The myth complex of the incest with the mother—and the related revolt against the father—is here combined with the second great complex, which has for its contents the erotic relations between father and daughter. Under this heading belongs besides other widely ramified groups of sagas (quoted in the author's "Incest Book," Chapter XI), the story which is told in countless versions of a *newborn boy,* of whom it is *prophesied* that he is to become the *son-in-law* and *heir* of a certain ruler or potentate, and who finally does so in spite of all persecutions (exposure and so forth) on the part of the latter.[77] Detailed literary references concerning the wide distribution of this story are found in R. Köhler, "Kleine Schriften," II, 357. The father who refuses to give his daughter to any of her suitors, or who attaches certain conditions difficult of fulfillment to the winning of the daughter, does this because he really begrudges her to all others, for when all is told he wishes to possess her himself. He locks her up in some inaccessible spot, so as to safeguard her virginity (Perseus, Gilgamos, Telephos, Romulus), and when his command is disobeyed he pursues the daughter and her offspring with insatiable hatred. However, the unconscious sexual motives of his hostile attitude, which is later on avenged by his grandson, render it evident that again the hero kills in him simply the man who is trying to rob him of the love of his mother: namely the father.

Another attempt at a reversal to a more original type consists in the following trait: The return to the lowly father, which has been brought about through the separation of the father's rôle from that of the king, is again nullified through the lowly father's secondary elevation to the rank of a god, as in Perseus and the other sons of virgin mothers; Karna, Ion, Romulus, Jesus. The secondary character of this godly paternity is especially evident in those myths where the virgin who has been impregnated by divine conception, later on marries a mortal (Jesus, Karna, Ion) who then appears as the real father, while the god as the father represents merely the most exalted childish idea of the magnitude, power and perfection of the father.[78] At the same time, these myths strictly insist upon the motive of the virginity of the mother, which elsewhere is merely hinted at. The first impetus is perhaps supplied by the transcendental tendency, necessitated through the introduction of the god. At the same time, the birth from the virgin is the most abrupt repudiation of the father, the consummation of the entire myth, as illustrated by the Sargon legend, which does not admit any father, besides the vestal mother.

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[77] In regard to further meanings of the grandfather, compare Freud, "Analysis of the Phobia of a 5-year-old Boy" (*Jahrbuch f. Psychoanalyse,* I, 1909, p. 7378; also the contributions by Jones, Abraham and Ferenzi (*Internat. Zeitschrift f. ärzt. Psychoanalyse,* Vol. I, 1913, March number).

The last stage of this progressive attenuation of the hostile relation to the father is represented by that form of the myth in which the person of the royal persecutor not only appears entirely detached from that of the father, but has even lost the remotest kinship with the hero's family, which he opposes in the most hostile manner, as its enemy (in Feridun, Abraham, King Herod against Jesus, and others). Although of his original threefold character as the father, the king, and the persecutor, he retains only the part of the royal persecutor or the tyrant, the entire plan of the myth conveys the impression as if nothing had been changed, but as if the designation as "father" had been simply replaced by the term of "tyrant." This interpretation of the father as a "tyrant" which is typical of the infantile ideation,[79] will be found later on to possess the greatest importance for the interpretation of certain abnormal constellations of this complex.

The prototype of this identification of the king with the father, which regularly recurs also in the dreams of adults, presumably is the origin of royalty from the patriarchate in the family, which is still attested by the use of identical words for king and father, in the Hindoo-Germanic languages[80] (compare the German "Landesvater," father of his country, = king). The reversal of the family romance to actual conditions is almost entirely accomplished in this type of myth. The lowly parents are acknowledged with a frankness which seems to be directly contradictory to the tendency of the entire myth.

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[78] A similar identification of the father with God (heavenly father, etc.) occurs, according to Freud, with the same regularity in the fantasies of normal and pathological psychic activity as the identification of the emperor with the father. It is also noteworthy in this connection that almost all peoples derive their origin from their god (Abraham, "Dream and Myth," Monograph Series, No. 15).

[79] An amusing example of unconscious humor in children recently ran through the daily press: A politician had explained to his little son that a tyrant is a man who forces others to do what he commands, without heeding their wishes in the matter. "Well," said the child, "then you and mamma are also tyrants!"

Precisely this revelation of the real conditions, which hitherto had to be left to the interpretation, enables us to prove the accuracy of the latter from the material itself. The biblical Moses-legend has been selected, as especially well adapted to this purpose.

Briefly summarizing the outcome of the previous interpretation-mechanism, to make matters plainer, we find the two parent-couples to be identical, after their splitting into the personalities of the father and the tyrannical persecutor has been connected; the high born parents being the echo, as it were, of the exaggerated notions which the child originally harbored concerning its parents. The Moses-legend actually shows the parents of the hero divested of all prominent attributes; they are simple people, devotedly attached to the child, and incapable of harming it. Meanwhile, the assertion of tender feelings for the child is a confirmation, here as well as everywhere, of the bodily parentage (compare Akki, the gardener, in the Gilgamos-legend; the teamster, in the story of Karna; the fisher, in the Perseus myth, etc.). The amicable utilization of the exposure motive, which occurs in this type of myth, is referable to such a relationship. The child is surrendered in a basket to the water, but not with the object of killing it (as for example the hostile exposure of Œdipus and many other heroes), but for the purpose of saving it (compare also Abraham's early history, p. 15). The danger fraught warning to the exalted father becomes a hopeful prophecy for the lowly father (compare, in the birth story of Jesus, the oracle for Herod and Joseph's dream), entirely corresponding to the expectations placed by most parents in the career of their offspring.

Retaining from the original tendency of the romance, the fact that Bitiah, Pharaoh's daughter, drew the child from the water, *i. e.*, gave it birth, the outcome is the familiar theme (grandfather type) of the king, whose daughter is to bear a son, but who on being warned by the ill-omened interpretation of a dream, resolves to kill his forthcoming grandson. The handmaiden of his daughter (who in the biblical story draws the box from the water, at the behest of the princess), is charged by the king with the exposure of the newborn child in a box, in the waters of the river Nile, that it may perish (the exposure motive, from the viewpoint of the highborn parents, here appearing in its original disastrous significance). The box with the child is then found by lowly people, and the poor woman raises the child (as his wet nurse), and when he is grown up he is recognized by the princess as her son (just as in the prototype the phantasy concludes with the recognition by the highborn parents).

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[80] See Max Müller, "Essais," Vol. II (Leipzig, 1869), p. 20 et seq. Concerning the various psychological contingencies of this setting, compare p. 83 *et al.* of the author's "Incest Book."

If the Moses-legend were placed before us in this more original form, as we have reconstructed it from the existing material,[81] the sum of this interpretation-mechanism would be approximately what is told in the myth as it is actually transmitted; namely that his true mother was not a princess, but the poor woman who was introduced as his nurse, her husband being his father.

This interpretation is offered as the tradition, in the re-converted myth; and the fact that this tracing of the progressive mutation furnishes the familiar type of hero myth, is the proof for the correctness of our interpretation.

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[81] Compare E. Meyer (*Bericht d. Kgl. preuss. Akad. d. Wiss.*, XXXI, 1905, p. 640). The Moses legends and the Levites: "Presumably Moses was originally the son of the tyrant's daughter (who is now his foster mother), and probably of divine origin." The subsequent elaboration into the present form is probably referable to national motives.

(*To be continued*)

Periscope

Review of Neurology and Psychiatry

(Vol. X, No. 9)

Subacute and Acute Inflammatory Reactions produced in the Spinal Cord by Infection of its Lymph Stream. David Orr, M.D., and R. G. Rows, M.D.

This is a research of some importance covering 32 pages, with 33 photographs. The authors began a series of experiments in 1903 on rabbits and dogs to demonstrate the histological evidence that toxins reach the spinal cord via the spinal roots. The present paper is a continuation of that work and deals with the inflammatory phenomena induced in the spinal cord by infecting the ascending lymph stream of the spinal nerves connected with it. The principle of the research is that the lymph stream in peripheral nerves is an ascending one, and that in it toxins and organisms are carried towards the central nervous system, and then produce very definite changes. Parenthetically, the authors agree with Wickman's view, that poliomyelitis is a disseminated myelitis of lymphogenous origin, and not due to selective action of toxin for nerve cells, from infection of the blood stream. The changes in the structures of the cord and its spinal nerves in the present experiments indicated a definite reaction to infection by organisms employed, varying with the potency of the noxious agent. The inflammation propagated by the toxic lymph to parts distant from the focus of greatest intensity also showed that the infection took a definite course. The rabbits experimented on lived from 3 days to 3 weeks. The spinal cords were fixed in absolute alcohol for the toluidin blue and pyronin-methyl-green stains, and in Weigert's chrome-alum-copper solution for the Alzheimer and Mallory stains. The tissues were cut in transverse and longitudinal section. The descriptions of the lesions found began with the reaction in the capsule of the posterior root ganglia and the dura mater with which it is continuous; then, passing inwards, took up the inflammation in the spinal roots, the pia arachnoid, the white matter and the gray matter of the spinal cord. Longitudinal sections proved especially useful in tracing the reaction from without inwards, because it was possible in the same section to compare the degree of intensity of the inflammatory process between one part and another in unbroken continuity from the ganglion to the center of the spinal cord. It was shown that the reaction diminished from without inwards, and that the dura mater and perineurium, with their covering of highly vascular loose areolar tissue, form a most efficient protection to the spinal cord and neutralize to a great extent the effects of infection.

Space will not permit even a synopsis of the descriptions. In one series of experiments the capsule containing the organisms employed, which had been placed under the erector spinæ muscle, had burst, and an abundant growth of the organisms had taken place in the surrounding tissues. From the seat of the capsule the organisms could be followed along the intercostal nerves to the posterior root ganglia and the dura mater.

The authors present the following arguments against the hematogenous theory respecting the mechanism by which the onset and the spread of the acute diffuse inflammation characterizing poliomyelitis is induced:

1. Infective conditions of the blood, with the formation of emboli or thrombi, cause isolated foci of inflammation in the spinal cord, but nothing resembling a diffuse myelitis in which the periphery is as much affected as the center. In poliomyelitis there is no evidence of thrombi, emboli, or necrosis, and the capillaries are not affected. Further, histological investigation shows that the inflammation occurs in connection with the veins and is not most marked around the central artery.

2. Assuming that infantile paralysis is hematogenous in origin, how is it that the cervical and lumbar enlargements are especially affected; and why do the areas supplied by the cerebral arteries escape to such an extent?

3. It is recognized that when once the inflammatory condition has been established in the spinal cord it spreads by direct continuity. This points to an infection of the lymph system.

4. The virus is rarely found in the blood of the human subject or of apes suffering from the disease.

5. A woman may suffer from poliomyelitis during pregnancy and the child may be quite healthy; and yet we know that the virus can pass through the densest filter.

On the other hand, the authors consider the following facts greatly favor the lymphogenous theory for the mechanism of the onset and spread of the poliomyelitis process:

1. From an extensive observation of the pathological anatomy Wickman has established a complete analogy between the phenomena present in poliomyelitis, rabies, and the ascending paralysis of Landry.

2. A similar analogy can be extended to Borna's disease, a contagious affection in horses in which the lesion attains its greatest intensity in the olfactory area of the brain, and the virus spreads along the olfactory nerves from the nasal mucous membrane.

3. It is now established beyond dispute that organisms, toxins, chemical fluids, and inert substances readily travel along the lymph system of nerves and so reach the spinal cord. Tetanus may be cited as the classical example of infection of the spinal cord by this mechanism.

4. The vessels of the central nervous system are surrounded by lymph sheaths, and it is in these that the inflammation in poliomyelitis and in the spinal cords in the writers' experiments is principally localized. Further, the extension of the lesion takes place along this path. The fact that the process is most marked in the anterior horns cannot be employed as an argument against the lymphogenous theory, because it is now admitted that the virus which causes the disease has a marked affinity for the lymph system, and, therefore, flourishes best in the areas most liberally supplied with vessels and lymph. And so, as Wickman points out, the anterior horns are most affected in the lower lumbar region, while in the upper lumbar and lower dorsal segments the most intense reaction is found in Clarke's column.

All this evidence, therefore, demonstrates that the part played by the lymphatic system in the pathogenesis of various lesions of the nervous system is all important.

We quote the following from among the further conclusions in the article:

In experimental lymphogenous infection of the spinal cord of a subacute nature, where all the inflammatory phenomena are extravascular and the path of the toxic lymph can be traced accurately, we find that in addition to the proliferation of the fibrous tissue in the meninges the only structures which react are the adventitial cells of the veins and capillaries and the neuroglia cells immediately surrounding them. The adventitia takes an extremely important part in the production of the cells of reaction, and this is not to be surprised at seeing that the cerebrospinal lymph flows directly into its spaces. Hence when a toxin gains the central nervous system by the lymph stream the cells of the adventitial sheath are the part of the vessel to be first attacked, and should the irritant be weak or permeate the tissues slowly no other phenomena need occur for some time. In more acute conditions, however, it is evident that the endothelial cells join in the process, and with a still greater degree of intensity of the infection we find that intravascular changes, such as hemorrhage and thrombosis, make their appearance.

But not only does the intensity of the reaction in its primary stage vary with the potency of the irritant; the forms assumed by the cells of reaction also vary. Thus it is that in the writers' research they found changes ranging from simple swelling of the nuclei together with a slight increase of the protoplasm around them to fully formed plasma-cells and polyblasts, and as the process advances these cells often become reticulated or epithelioid in type, and by the imbibition of products of degeneration assume the characters of the compound granular corpuscles which so constantly are a feature of the secondary phases of inflammation. The entire reaction, therefore, although it presents several stages, is one continuous process.

C. E. Atwood (New York).

Notes and News

MUNICH PSYCHIATRIC CLINIC EXTENSION COURSE

The next annual Extension Course in Psychiatry of the Munich Psychiatric Clinic, Prof. Emil Kraepelin, will be given in 1914 and will extend from February 16 to March 8 of that year. The following lectures, demonstrations and clinics will be held:

Allers: Chemical Pathology and Dietetic Treatment of Psychoses, 7 hours.
Brodmann, of Tübingen: Topographical Histology of the Cortex, 10 hours.
Isserlin: Experimental Psychology, 7 hours.; Psychotherapy, 5 hours.
Kraepelin: Psychiatric Clinics, 17 hours.
Liepmann, of Berlin: Aphasic, Agnostic and Apraxic Disorders, 12 hours.
Plaut: Cerebrospinal Serology and Cytology, 6 hours; Forensic Psychiatry and Juvenile Delinquents, 6 hours.
Rüdin: Degeneracy and Heredity of Mental Disorders, 5 hours.
Spielmeyer: The Anatomical Bases of Mental Disease, 14 hours.
Weiler: Psychopathological Examination Methods, 8 hours.

Applications to be sent to Privatdozent Dr. E. Rüdin, Oberarzt. Nussbaum Strasse 7, Munich. The fee is 61 marks.

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